

MANAGEMENT OF SPRINKLER IRRIGATION SYSTEM FOR LANDSCAPING USING LOW-QUALITY WATER

By

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ABSTRACT

Shimaa Eweys Abd El-Fattah Ali: Management of Sprinkler Irrigation System for Landscaping using Low-Quality Water. Unpublished M.Sc. Thesis, Department of Agricultural Engineering, Faculty of Agriculture, Ain Shams University, 2019.

This research aimed to obtain identify the effect of low-quality water (grey water and agricultural drainage water) on the performance analysis of the turf irrigation system. Two experiments were conducted to determine the impact of low quality water on the sprinkler irrigation system and landscaping.

First Experiment was conducted between salt water (agricultural drainage water) and tap water during of April to June 2016 and carried out at Somosta District in Beni Suef site, the area under investigation was 270 m², it was divided into 6 plots, and the geometrical plot was (3×9) m.

Second Experiment was conducted between grey water (reused water after filtration) and tap water during of April to June 2016 and carried out at El-Rehab site, the area under investigation was 450 m², it was divided into 6 plots, and the geometrical plot was (5 × 15) m.

In First experiment and Second experiment was used the Investigated variables was agricultural drainage water in Somosta, meanwhile, grey water in El-Rehab. The investigated parameters were the percentage of the applied amounts of irrigation water with a percent of (100; 85; 75) %. The response of plant growth landscaping parameters due to irrigation water types were color, length, density and its coverage on the after heads, the effect of grey water and agricultural drainage water on the turf irrigation system was compared through the study of (uniformity, Surface roughness, Clogging ratio,), of sprinklers during same the irrigation period.

Results of the applied could be summarized as followed in Beni Suef experiment:

1. Accumulative clogging ratio by using saline water was (33.86 – 24.44 – 24.44) % % and tap water was (7.29 – 6.28 – 5.25) % throw the period of treatment in (April - May - June).
2. Illustrates in tap water turf quality rate for color, density and ground cover were very good. Meanwhile, illustrates in saline water turf quality rate for color, density and ground cover were good at (100; 85; 75) % of quantity the water required for the plant.
3. Using the electronic microscope, the roughness in the main irrigation lines was measured after the use of saline water erosion ranging from (77.67 – 5.15) μm and the sediments ranging from (53.36 – 4.21) μm . also the tap water erosion ranging from (42.67 – 11.62) μm and the sediments ranging from (35.71 – 16.46) μm .

Results of the applied could be summarized as followed in EL-Rhab experiment:

1. The accumulative clogging ratio by using tap water was (8.68 – 7.66 – 4.50) % and grey water was (15.28 – 11.25 – 8.22) % throw the period of treatment in (April - May - June).
2. Illustrates in tap water turf quality rate for color, density and ground cover were very good. Also, illustrates in grey water turf quality rate for color, density and ground cover were very good at (100; 85; 75) % of quantity the water required for the plant.
3. Using the electronic microscope, Surface roughness in the main irrigation lines was measured after the use of grey water and tap water. The erosion ranging from (17.93 – 65.35) μm and the sediments ranging from (15.48 – 58.22) μm in grey while the erosion of tap water ranging from (10.45 – 34.89) μm and the sediments ranging from (9.06 – 45.22) μm .

Keywords: grey water, saline water, landscape, turf grasses, agricultural drainage water.

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CONTENTS

	Page
LIST OF TABLES	I
LIST OF FIGURES	II
1- INTRODUCTION	1
2- REVIEW OF LITERATURE	4
2-1- Landscape	4
2-2- Turf quality index	6
2-3- Sprinkler definition	7
2-4- Irrigation scheduling	8
2-5- Irrigation uniformity distribution	8
2-6- Water quality	10
2-6-1- Water quality problem	12
2-7- Water resources in Egypt	13
2-7-1- Water scarcity in Egypt	15
2-8- Grey water definition	15
2-8-1- Grey water characteristics	17
2-8-2- The disadvantages and the advantages of grey water	17
2-8-3- Reuse of grey water for irrigation	19
2-9- Irrigation with saline water	21
3- MATERIALS AND METHODS	25
Frist Experiment in Somosta city Beni Suef Governorate	25
3-1- Experiment Location	25
3-2- Soil properties and irrigation water analyses	25
3-3- Irrigation network	27
Second Experiment in Al-Rehab city at Cairo	29
3-4- Experiment Location	29
3-5- Soil properties and irrigation water analyses	29
3-6- Irrigation network.	30
3-7- Description of landscaping plants	33
3-8- Calculated and Measurements in Beni Suef and EL-Rbab.	34
3-9- Estimating Evapotranspiration	35

	Page
3-10- Estimating of irrigation requirements:	37
3-11- The Flow rate :	37
3-12- Sensitive for clogging	37
3-13- Distribution uniformity:	37
4- RESULTS AND DISCUSSION	38
First Experiment in private farm at Somosta city Beni Suif Governorate.	38
4-1- Distribution uniformity (CU)	38
4-2-Irrigation schedule.	38
4-3- Calibration of sprinkler	39
4-3-2- Effect of time on the sprinkler flow rate under different quantity of water	41
4-4- The validity of irrigation water on turf grasses	43
4-5- Clogging ratio.	44
4-6- Surface roughness	46
4-6-1-Main irrigation lines	46
4-6-2-Sub main irrigation lines	47
4-6-3-Main fold irrigation lines	48
Second Experiment in Al-Rehab city at Cairo.	49
4-7- Distribution uniformity (CU)	49
4-8-Irrigation schedule	49
4-9- Calibration for sprinkler	50
4-9-1- Effect of pressure on the sprinkler flow rate under different cases of quantity of water	50
4-9-2- Effect of time on the sprinkler flow rate under different quantity of water	52
4-10- The validity of irrigation water on turf grasses	54
4-11- Clogging ratio.	55
4-12- Surface roughness	57
4-12-1- Main irrigation lines	57
4-12-2- Sub main irrigation lines	58

	Page
4-13-3- Manifold irrigation lines	59
5- SUMMARY AND CONCLUSION	60
6- REFERENCE	71

LIST OF TABLES

	Page
Table (1): Some Soil properties of Somosta in Beni Suef .	26
Table (2): Some chemical properties of saline water in Beni suef.	26
Table (3): Technical Specification of the Pump used in the experiment site.	28
Table (4): Technical Specification of the used Sprinkler, Nozzle 8A Brown.	28
Table (5): Some soil properties of Al-Rehab site when using grey water.	29
Table (6): Some chemical properties of grey water in Al-Rehab.	30
Table (7): Some biological characteristics for grey water.	30
Table (8): Technical specification of the Pumping unit.	32
Table (9): Technical Specification of the used Sprinkler, Nozzle 15A Black.	32
Table (10): Technical specifications of the Control panel ESP-Me.	33
Table (11): Periodic maintenance of the surface.	34
Table (12): Climate data of experiment (A) location in Beni Suef.	34
Table (13): Climate data of experiment (B) location in ElRhap:	34
Table (14): cover percent for lawn plant (paspalum).	35
Table (15): Species Factor (K_s) for different plant types.	36
Table (16): Microclimate Factor (K_{mc}) for different plant types.	36
Table (17): Density Factor (K_d) for different plant types.	36
Table (18): Field uniformity values (F.EUa,F.Eu).	38
Table (19): Effect of irrigation water on Distribution uniformity.	39
Table (20): Irrigation water requirements in Beni Suef .	40
Table (21): Effect of pressure on the sprinkler flow rate.	40
Table (22): Effect of time on the sprinkler flow rate.	42

	Page
Table (23): Effect tap water and saline water irrigation on turf grasses.	45
Table (24): Effect of tap water and saline water irrigation on the blockage of sprinkler.	45
Table (25): Effect of irrigation water on Distribution uniformity.	50
Table (26): Irrigation water requirements in EL-Rhab.	51
Table (27): Effect of pressure on the sprinkler flow rate.	51
Table (28): Effect of time on the sprinkler flow rate.	53
Table (29): Effect tap water and saline water irrigation on turf grasses.	55
Table (30): Effect of tap water and grey water irrigation on the blockage of sprinkler.	57

LIST OF FIGURES

Fig. No.		Page
1	Water resources in Egypt.	14
2	Residential water use in Egypt	16
3	Layout of the experimental site turf irrigation system and water irrigation' treatments in Beni suef.	27
4	Layout of the experimental site turf irrigation system and water irrigation' treatments in EL-Rhab.	31
5	The values of distribution uniformity in saline water and tap and saline water.	38
6	Effect of pressure on the sprinkler flow rate at quantity of water (100%).	40
7	Effect of pressure on the sprinkler flow rate at quantity of water (85%).	40
8	Figure (8): Effect of pressure on the sprinkler flow rate at quantity of water (75%).	41
9	Effect of time on the sprinkler flow rate at quantity of water (100%).	42
10	Effect of time on the sprinkler flow rate at quantity of water (85%).	42
11	Effect of time on the sprinkler flow rate at quantity of water (75%).	43
12	Accumulative clogging ratio by using saline water was and taps water.	45
13	Effect of tap water and saline water irrigation on impurities at (100) %.	45
14	Effect of tap water and saline water irrigation on impurities at (85) %.	46
15	Effect of tap water and saline water irrigation on impurities at (75) %.	46
16	Surface roughness for main lines by using tap water, saline water.	47

Fig. No.		Page
17	Surface roughness for main lines by using tap water, saline water.	48
18	Surface roughness for main lines by using tap water, saline water.	48
19	Distribution uniformity (CU) in tap water and grey water.	49
20	Effect of pressure on the sprinkler flow rate at quantity of water (100%).	51
21	Effect of pressure on the sprinkler flow rate at quantity of water (85%).	51
22	Effect of pressure on the sprinkler flow rate at quantity of water (75%).	52
23	Evaluate between time and flow rate in grey water and tap water (100%).	53
24	Evaluate between time and flow rate in grey water and tap water (85%).	53
25	Evaluate between time and flow rate in grey water and tap water (75%).	54
26	Accumulative clogging ratio by using saline water was and tap water.	55
27	Effect of tap water and grey water irrigation on impurities at (100) %.	56
28	Effect of tap water and grey water irrigation on impurities at (85) %.	56
29	Effect of tap water and grey water irrigation on impurities at (75) %.	57
30	Surface roughness for main lines by using tap and grey water.	58
31	Surface roughness for sub main lines by using tap and grey water.	59
32	Surface roughness for manifold lines by using tap and grey water.	59