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

By

SHIMAA EWEYS ABD ELFATTAH ALI
B.Sc. Agric. Eng., Faculty of Agric., Suez Canal University, 2013

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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 Unpublished M.Sc.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 amid 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 Distinct 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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