

EFFECT OF REVERSE OSMOSIS CONCENTRATE ON PLANT GROWTH AND SOIL PROPERTIES

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Since most hypotheses on etiology of Chronic Kidney Disease is based on drinking water quality, a programme to supply quality water was implemented in Sri Lanka. Reverse Osmosis (RO) plants are the most effective method for supplying potable water for Chronic Kidney Disease of unknown etiology affected areas. However, it releases a large amount of concentrated water to the environment and this may create environmental issues in near future. A study was undertaken at *A/Kebithigollewa Madya Maha Vidyalaya* during the period March-August, 2015 to identify the possibilities of using the concentrate as irrigation water and to find out its effect on soil properties and plant growth. Four treatments (T₁-RO concentrate with Cannas, T₂-RO concentrate on bare soil, T₃-Well water with Cannas and T₄-Well water on bare soil) were arranged in Random Complete Block Design (RCBD) with four replicates. Before planting and at the end of the experiment, soil samples were taken to analyze soil physical and chemical parameters. Plant growth parameters were measured during the growing stage and also at the end. Water quality of RO concentrate and well water were also measured. The results revealed that, application of RO concentrate significantly increased ($p < 0.05$) the pH, EC, calcium, magnesium, potassium, sodium and available phosphorus, except available nitrogen of soil. Sodium percentage and sodium absorption ratio showed that, both sources were compatible for irrigation. Salinity level of RO concentrate (0.642 dS m⁻¹) was doubtful for use, as irrigation water. The use of RO concentrate, significantly reduced ($p < 0.05$) plant height, leaf area, total biomass and number of flowers. Significant differences were not observed in soil properties of bare and planted soil. Based on the results, it can be concluded that, there is a significant effect of RO concentrate on plant growth and soil properties. Therefore, remedial measures have to be taken to control deterioration of soil properties and special management practices are required to use RO concentrate as irrigation water.

Keywords: Growth parameters, Reverse osmosis, Soil properties, Well water