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EFFECT OF CLAY SOIL CONTENT ON FECAL BACTERIA REMOVAL IN AN INTERMITTENT MEDIA INFILTRATION SYSTEM

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Abstract

Water scarcity, the degradation of freshwater resources, and wastewater pollution are reaching crisis levels, especially in arid regions of the world. The reuse of wastewater was investigated by using intermittent media infiltration (IMI) to evaluate fecal coliform (FC) removal efficiency. Twelve IMI columns were packed with soil and natural filtering materials (sand, zeolite, vermicompost and charcoal) at percentages of 25, 50 and 75. The municipal wastewater was treated for the FC analysis for four weeks. The chemistry, physics, and morphology of the filter media as related to FC reduction were determined and characterized. Fine particle size and adsorption capacity are important factors for retaining FCs. The mixture of clay soil and filter media in a ratio of 75/25 gave the best performance for FC removal, and the average FC reductions for sand, zeolite, vermicompost and charcoal were 94.4%, 82.2%, 93.8% and 99.6%, respectively. The IMI of soil/charcoal gave a higher log removal (2.19-2.46 log) than the other media, and the effluent complied with Mexican regulations for unrestricted agricultural irrigation. These results showed good performance for FC removal and strengthened the possibility of using reclaimed municipal wastewater in unrestricted irrigation.

Key words: bacteria, column, filter media, soil, wastewater reuse

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