



Peri-Urban Vertisol Properties as Influenced by Sewage and Bore Well Water Irrigation to Wheat (*Triticum aestivum* L.)

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Abstract

Field experiment was conducted in farmer's field near Agricultural Research Station, Dharwad, Karnataka State, India which was on the bank domestic sewage course in split plot design with three replications. Main plots included two types of lands (land irrigated with sewage water since 1970 and land irrigated with bore well water since 1992). Sub plots allotted with sources of irrigation consisted of sewage alone, bore well water alone (good water) and alternate sewage and bore well water. Analysis of sewage water for major and minor plant nutrients content revealed its potential as source of nutrients and water for crop growth. The soil physical properties especially bulk density and moisture holding capacity was improved significantly in sewage land over bore well irrigated land. Yield of wheat crop was positively correlated with these soil properties. There was reduction in soil pH in sewage land (7.24) over bore well irrigated land (7.65). The sewage irrigated land recorded significantly more bacterial and fungal colonies, dehydrogenase and alkaline phosphatase enzymes activities in soil. Sources of irrigation also differed significantly producing the highest microbial colonies, phosphatase and dehydrogenase enzymes activity in sewage water irrigation treatment followed by alternate irrigation as sewage water is good source of organic phosphorus (11.9–17.3 ppm). Irrigation with sewage water improved the performance of wheat crop as evidenced by higher grain yield (4100 kg ha⁻¹), protein content in grains (12.8%), and dry gluten (8.9%) compared to bore well water irrigation. Characterization of domestic sewage effluent showed that it can be used as source of irrigation water and top dressing nutrients.