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LOW-COST TREATMENT OF GREY WATER AND REUSE FOR IRRIGATION OF HOME GARDEN PLANTS

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Abstract

Reuse of grey water is an attractive option when available water supplies are limited, and can reduce demand on water supplies and provide additional water resource. This comparative research was conducted to assess the suitability and effects of reusing grey water, treated and untreated, as irrigation water for vegetables, compared with tap water. Tomato (*Lycopersicon esculentum*) and green bean (*Phaseolus vulgaris*) plants were selected as examples. The collected grey water samples were treated through simple filtration processes using natural volcanic tuff, sand, and zeolite as filtration media. Initial characteristics and the efficiency of treatment in terms of physical, chemical, and biological parameters were determined and high removal efficiency was obtained for COD (82%-87.4%), PO₄⁻ (85%-100%), NO₃⁻ (75%-64%), and Turbidity (58%-89%). Raw grey water, treated grey water, and tap water were used as irrigation water for tomato and green bean plants under a controlled temperature and humidity environment. Growth patterns and rates, and soil properties for each plant were monitored at assigned time intervals. The results indicated better fruit yields, biological yields, and circumference of green beans plants irrigated with tap and treated grey water than untreated grey water. Except number of leaves no significant difference was found in any measurement for tomato plants. In conclusion, the effects of reusing grey water for irrigation depend on the type of plant irrigated and the quality of treatment. The results also suggest that long-term application of grey water can lead to increased soil alkalinity and salinity.

Key words: grey water, green bean, irrigation, reuse, tomato, volcanic tuff, zeolite

Received: October, 2012; *Revised final:* October, 2013; *Accepted:* October, 2013

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