Assessment of the Potential for Gray Water Reuse for Landscape Irrigation in Georgia
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EXTENDED ABSTRACT

Current regulations in the State of Georgia legislation do not encourage homeowners to implement automated gray water reuse systems for landscape irrigation. Homeowners are limited to the application of gray water via watering cans. Furthermore, this hand application of the gray water to the landscape must occur at the time of gray water production as the regulations prohibit storage of gray water. Successful implementation of gray water landscape irrigation systems will require a complete understanding of the risks and benefits associated with these systems as well as identification of design parameters for reliable long term operation.

The goal of this experiment was to evaluate the risks, benefits, and design issues associated with use of gray water for landscape irrigation. This was accomplished by running bench-scale gray water landscape irrigation systems. These systems consisted of gray water storage for approximately seven days followed by irrigation of vegetation. Seven independent storage systems were implemented. Three of the seven systems utilized untreated gray water (shower, laundry, and mixed shower/laundry water) and three of the systems chlorinated the source samples (shower, laundry, and mixed shower/laundry water) prior to storage. The final system was a control system using tap water as the water source. Two grasses (St. Augustine and Centipede) and a ground cover (Ajuga) were irrigated with the water drained from the storage tanks. The experiment was run for approximately seven weeks. Testing consisted of measuring pH, fecal and total coliforms, electrical conductivity (EC), chemical oxygen demand COD, residual chlorine, solids (total, suspended, and dissolved), and recording visual observations.

Analyses indicated that storage with or without chlorination will decrease both fecal and total coliforms levels. Chlorination further reduced these levels. There was no significant change in COD ($\alpha=0.05$) as a result of storage. As would be expected, EC increased as a result of chlorination but did not change as a result of storage. Storage did appear to have some impact on pH however all observations were of neutral pH. There was no detectible change ($\alpha=0.05$) in solids concentrations as a result of storage. Results did not suggest that solids would be a significant problem for an irrigation system, however further research is recommended.

Plant growth was evaluated through visual inspections and by massing the amount of grass grown over 6 weeks. Accelerated growth was observed in grasses watered with stored chlorinated gray water. The soil pH remained neutral through out the experiment.
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