Name(s)

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Project Number

S1117

Project Title

The Use of a Greywater System and Fish to Produce Organic Fertilizer

Abstract

Objectives/Goals
The purpose of this experiment was to create a water system that cleans greywater, transfers the water to a fish pond, and extracts the fertilized water from the pond to saturate plots of grass and rosemary bushes. My project consisted in studying if the fertilized water from the pond helped the plants grow quicker and taller than the greywater-supplied plants.

Methods/Materials
This system was built using plastic bins for the tanks and filters, pvc pipe, four pumps, and subterranean drip tubing. The filters used silt fabric, three one-pound carbon bags, and zeolite crystals. The plants tested were 12 rosemary bushes placed inside 12 1ft x 1ft plots of grass. The six plots of grass and six rosemary bushes were watered with the fish-fertilized water, and the other six plots and bushes were watered with greywater. Each set of plants were watered for 15 minutes every other day with water pumping at 0.9 gph. This supplied each plot with 0.225 gallons of water.

Results
The growth rates of the plants were compared using a Student T-Test. The p-value for the grass was 0.628 and the p-value for the rosemary was 0.826, providing evidence towards the null hypothesis. The water system could keep the ph at 7.0-7.2, ammonia levels at 0.25-0.50 ppm, nitrite levels 0.50-1.00 ppm, and nitrate levels to 0-5.0 ppm in the fish pond.

Conclusions/Discussion
I was successful in creating a working water system that cleaned greywater with the aid of acclimation chemicals. The system kept the water at a pH level of 7.0-7.2 and keeping ammonia, nitrite, and nitrate levels at a low ppm, allowing for a safe environment for the fish. These results suggest that a system similar to the one this could be used in public areas to supply fertilized water to lawns and spaces with lots of vegetation.

Summary Statement

My project is creating a water system that cleans greywater, and supplies it to a fish pond as fish-fertilized water is removed and is used to water plants.

Help Received

I had minimal help with the assembly of the water system. I needed help learning the tools I would be using as well as attaching the pipes to each other, which I received from a mentor. I also needed help in making sure my data was interpreted correctly, which I received from our statistics specialist at school.