CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY

Name(s)

Gerardo de Jesus Lancaster

Project Number

J1117

Project Title

Water Reuse: The Effect of Detergent on Plant Growth

Abstract

Objectives/Goals

The objective is to determine if plants can be safely watered with greywater-water created in a household containing soap, detergent, or other impure material residue.

Methods/Materials

Twenty five identical planting pots were prepared in a standard way with soil and Rye grass seed. These plants were separated into groups of five, with the purpose of each group being irrigated with different water-detergent solutions. The irrigation took place as follows: The first group was irrigated with freshwater. To irrigate groups 2-5 a water-detergent mixture was prepared for each group. This mixture contained 1.8L of freshwater titrated with 1.0 ml or gram of detergent; For group 2, Tide 2x Ultra liquid detergent was used; For group 3 Tide Solid; For group 4, Purex 2x Ultra liquid; and for group 5, Purex Ultra liquid detergent was used. Tide taking the role of common detergent and Purex being biodegradable. The mixture for each group was then separated equally into five parts and applied to every plant. I utilized the experimental method by variating irrigation water for each group; From here I proceeded to observe and measure changes for both the quantitative and qualitative characteristics of all subjects.

Results

Average height was improved by up to 19% utilizing biodegradable detergent mixtures, against the use of freshwater for irrigation. While by using common detergent mixtures, average height was negatively affected by up to 14%, in contrast to freshwater irrigation.

Conclusions/Discussion

Groups of plants watered with common detergents depicted clear negative effects in their growth, health and density compared to the control, freshwater. At the same time, plants watered with biodegradable detergent solutions, compared to the control, showed important benefits in height and size. In addition these plants always showed perfect health and accomplished the best density per square centimeter. the effect biodegradable detergent has on plants can be best described as a fertilizer, making it safe and beneficial to use in the irrigation of plants.

Summary Statement

Determine the effect that the use of biodegradable and common detergents, for the irrigation of plants, has in their growth and development.

Help Received

Father helped type report; Mother helped glue board.