CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)

Gerardo de Jesus Lancaster

Project Number

J1014

Project Title

Water Reuse: The Effect of Detergent in the Irrigation of Food Crops

Abstract

Objectives/Goals

The objective is to determine if food crops can be irrigated using gray water and to observe the effect of the water on the crop's development and growth.

Methods/Materials

Thirty six identical planting pots were prepared in a standard way with potting soil and two different crop seeds. These plant subjects were separated into groups of six, with the purpose of each group being irrigated with a different water or detergent solution. Groups (A-C) consisted of one crop, while groups (D-F) consisted of another. The irrigation of crops took place as follows: Groups (A) and (D) were irrigated with freshwater. Groups (B) and (E) were irrigated with a common detergent solution. Groups (C) and (F) were irrigated with a biodegradable detergent solution. The detergent solutions consisted of 1 ml of detergent titrated with 1.8 L of freshwater. This ratio of detergent and water is proportional to the detergent concentration in the average washing machine. All crops were irrigated equally with a moderate amount of water. Each crop was measured individually utilizing various parameters, such as height, health, and hydration. With these parameters I was able to observe both the quantitative and qualitative characteristics of all subjects.

Results

It was observed that crops irrigated with the biodegradable detergent solution achieved benefits in growth by demonstrating a significant height increase in comparison with the control. Crops irrigated with common detergent solutions did not display significant increases or decreases in growth. Instead, they maintained a consistence with the results of the control, crops irrigated with freshwater.

Conclusions/Discussion

Crops irrigated with biodegradable detergent solutions displayed benefits in height, in comparison with the control. These crops even proved to have the best health and hydration among all other groups. Crops irrigated with common detergent solutions exhibited consistency with the control. The effect that a biodegradable detergent has on crops can be best described as a fertilizer, due to the benefits it presents to the growth of food crops. All in all, water reuse for the irrigation of food crops is a potential and safe way to save water.

Summary Statement

Determine the effect on the growth and development of food crops when irrigated using biodegradable or common detergents.

Help Received

Mother helped glue board; Father helped review report.