CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

Gary Shirikchian

Project Number

J1824

Project Title

Gary's Hydroponic Garden

Abstract

Objectives

Currently, parts of the world, such as Cape Town, South Africa, are running out of an essential part of human life, water; water is used to grow crops, cook food, and is used on a daily basis in numerous ways. To conserve water especially in one of the most water-consuming activities, agriculture, hydroponics could be used as an alternative. The objective of these experiments was to determine the ability to grow plants without soil, and avoid plants from pesticides, and most importantly to conserve water while still growing plants efficiently and faster.

With the completion of my research, I discovered that not only do hydroponic agricultural methods conserve a large amount of water compared to traditional agriculture, the methods also grow plants faster and larger because of the direct water and nutrient source. Due to this information, I hypothesized that the ebb and flow hydroponic system will work more efficiently than soil and aeroponics in both conserving water and growing plants larger and faster.

Methods

To the experiments that I conducted, there are two procedures. Procedure one begins with filling the reservoir with plants, water, and nutrients at the 12 mark which is at the six-inch mark. Once the plants are in regularly water the plants in the hydroponic systems twice a day seven days a week for one minute and regularly water the plants in soil three times a week until the water drips through the bottom hole of the planting cups. Throughout the weeks while watering the plants make sure to mark down the number of gallons used when watering plants. To find the amount of water lost in the hydroponic systems use the side ruler and the scale of 0.5 inch=1 gallons to measure the loss of water per week in units of gallons and percents.

The second procedure of my experiment is testing which method of irrigation is the most efficient when it comes to growing plants faster and larger organically. Once the plants are placed in the hydroponic system and in the soil water the plants at the necessary amount. Throughout the process of growing the plants mark the plants with a colorful tab for calibration purposes and measure the height of the plants. For every week that goes by measure the heights of the plants in units of inches and compare the results of each type of method to one another. If the mints outgrow the system trim the leaves of the mint but continue to add onto the past height of the plant as the plants grow. The apparatus itself was constructed by me with assistance with power tools such as a power saw from my father. The exterior is made mostly from tinted plexiglass and clear plexiglass, while the interior is made from plexiglass, mesh, PVC pipes, plastic cups,

Summary Statement

I showed that when using either hydroponic method, plants grow faster and larger and most of the water usin in the hydroponic methods were saved and reused, where they could not be in soil.

Help Received

I recieved help from my father with power tools suc as power saws and assistance from my father when bending the plexiglass with a heatgun.