CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
Matthew M. Houlihan

Project Number
S1007

Project Title
Water-Wise Farming

Abstract

Objectives/Goals
Less water will be required to grow plants in a healthy environment using an aquaponics farming method compared to a traditional soil farming method. If I grow tomato and lettuce plants using both types of systems, then less water will be necessary using the aquaponics farming method.

Methods/Materials
Two 10-gallon aquariums, two 2.5-quart plastic buckets for grow beds, four tomato plants, four lettuce plants, soil potting mix, lava rock, twenty gold fish, submersible pump, water filter, fish food, light, and water. Measured amount of water used for each grow bed for the growth of healthy tomato and lettuce plants over seven weeks.

Results
The two farming methods used different amounts of water during the seven weeks of testing. The aquaponics farming method started with 32 liters of water and required additional water throughout the testing period. By the end of the testing period, an additional amount of 11.3 liters was added to the aquaponics system. The traditional soil farming system began with 0 liters of water and over the course of the seven weeks, 38.85 liters of water was used. For the seven week period, the traditional soil farming used less water than the aquaponics system. However, based on the steady increase in water use in the traditional farming system, a period of longer than seven weeks would show that the traditional farming method would use more water than the aquaponics farming method.

Conclusions/Discussion
Water conservation has become a way of life in California. Various techniques are sought to reduce the amount of water used, especially within urban areas. Because traditional farming uses the majority of the water in California, alternative techniques to grow fruits and vegetables need to be explored. Based on my experiment, I found that the use of aquaponics systems would substantially reduce the amount of water used to grow fruits and vegetables compared to traditional soil farming. We could yield more plants and use less water if aquaponics systems are used over a long period of time.

Summary Statement
The Water-Wise Farming experiment explores an alternative farming method (Aquaponics) to reduce water use to grow vegetables compared to the traditional soil farming method.

Help Received
The help that I received was from a family friend, Scott Thompson, who assisted me in setting up and constructing the aquaponics and traditional soil farming grow beds.