Aquaponics and Hydroponics; Experimentation in Real World Environments

Bedgood, Makayla (School: South Sumter High School)

Soil depletion and loss of water due to evaporation, is greatly affecting agriculture efficiency across the globe. This project aims to solve this global crisis by doing a comparative study of aquaponics, hydroponics, and traditional farming systems in a real world environment. To conduct this experiment, aquaponics, hydroponics, and traditional farming systems using PVC pipes, chicken wire, Styrofoam, and zip ties. All systems were placed in real world scenarios. Within these systems, 27 cucumber plants were grown. The plants and fish were monitored for a total of 15 weeks. The results were for the first 2 weeks of all systems, 3 trials, there was a flower bloom but no growth of cucumbers. The total average growth of the aquaponics over 5 weeks was 6cm, hydroponics was 4.5cm, and traditional was 3.5cm. When the fish were received from the hatchery, average length was 5cm. Total growth of Tilapia in the experiment of the aquaponics was 6cm and the contained environment 2cm. In conclusion aquaponics system shows higher growth rates than the hydroponics and traditional farming. The in the aquaponics had a longer average length than the Tilapia in the contained environment. This study proved the hypothesis to be correct, that in fact if aquaponics are implemented into natural or man-made lakes correctly, then there is a reliable way to grow food where land is sparse. Future studies will be to determine evapotranspiration rates to determine if it will also reduce the amount of water evaporation.

Awards Won: