

Assessing Naturally Fish-Bearing Water for Aquaponics

Sanders, Charlotte (School: Baton Rouge Magnet High School)

Aquaponics is a process of producing food through a symbiotic relationship between fish, which provide nutrients, and plants, which purify water. This project assesses the effectiveness of naturally fish-bearing water sources as the base of aquaponics systems. Using natural water sources increases the sustainability of aquaponics by reducing the need to stock and transport fish, reducing the costs associated with aquaponics, and making it an even more effective form of agriculture. This project aims to discover whether the natural nutrient levels of these water sources are sufficient to produce lettuce. To test this I built a system consisting of 4 tubes, each containing a different water source, one of which was the control. Each source was tested every two days, and the water was replaced every 3 days. Two types of lettuce were used, and the height and width of each plant were measured every second day. The weight of the lettuce was measured at the end of the growing period. The water sources with nitrate levels of 3 parts per million or above produced larger and visibly healthier plants, and water sources containing less phosphorus grew smaller plants with leaves exhibiting more "burns" and yellowish hues, signifying a nutrient deficiency. The water sources all successfully grew plants because they contained at least a small amount of each of the nutrients tested for, though the sources with smaller amounts of nutrients were less effective. Using natural water sources could be incredibly beneficial as a sustainable way to grow food for a community or as a more economically sound method for farmers; however, it is only applicable to sources that contain more appropriate levels of nutrients.

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