

The effect of fish wastes and fertilizer on the growth of strawberry and chili plants

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Introduction

Plants need essential nutrients in order to grow. A nutrient that limits plant growth is considered to be essential. When plant growth is limited the plant life cycle cannot be completed. Fertilizers are a good source of nutrients.

Aquaponics is the combination of aquaculture (fish) and hydroponics that grows fish and plants together in one integrated system. The fish wastes provide an organic food source for the plants, and the plants naturally filter the water for the fish.

This research was conducted and designed to find out how does fish waste (aquaponics) and fertilizer affects the growth of chili and strawberry plants, and to compare the differences of plant growth between them.

This research is a perfect way to learn science in a hands. Moreover, it plays vital role in creating awareness about the essential needs for plants to grow well which are nutrients. Also, to find out how fish waste also acts as nutrients for the plants.

Research question

Main research question:

What is the effect of fish waste (aquaponics) and fertilizers on the growth of chili and strawberry plants in hydroponic culture ?

Minor questions:

1. What is the effect of fish waste (aquaponics) on the growth of chili?
2. What is the effect of fish waste (aquaponics) on the growth of strawberry?
3. What is the effect of fertilizer on the growth of chili in hydroponic culture?
- 4 . What is the effect of fertilizer on the growth of strawberry in hydroponic culture?



Methodology

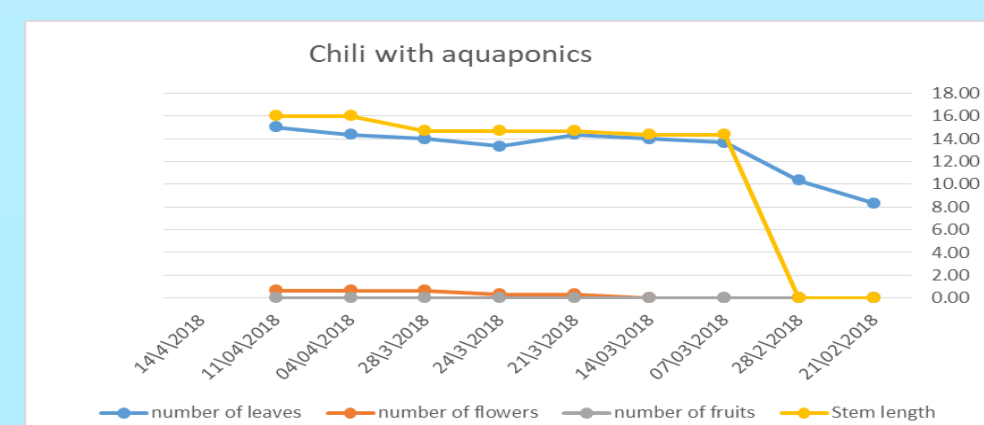
Our research is an experimental research, and the independent variables are the fish waste and fertilizers, where the dependent variable is the growth of chili and strawberry plants. And this is determined by measuring the number of leaves and flowers and fruits for strawberry. And the number of leaves and flowers and stem length for chili. Data were collected twice a week within two months. So we cultivated chili and strawberry plants in three systems:

1. Hydroponic with water only and without fertilizers(controlled group).
2. Hydroponic with fertilizers (experimental group #1). Where we added one spoon of fertilizer once a week.
3. Aquaponics (experimental group#2). Where we fed fish one time daily.

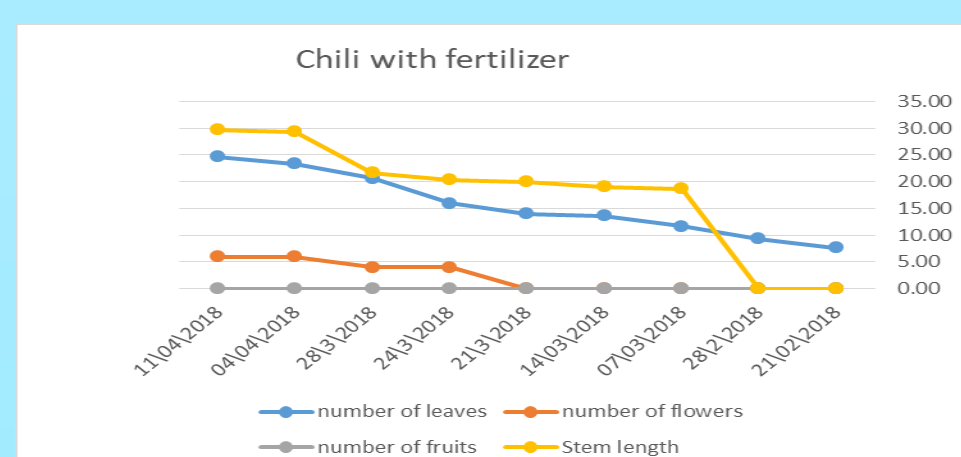
Results

Data was collected within two months, the results was that chili grows the best in the system where fertilizers were added, then in the aquaponics, then in the system with water only(the slowest).While strawberry grows the best in the aquaponics and get flowers and fruits ,and has no flowers nor fruits in the others.

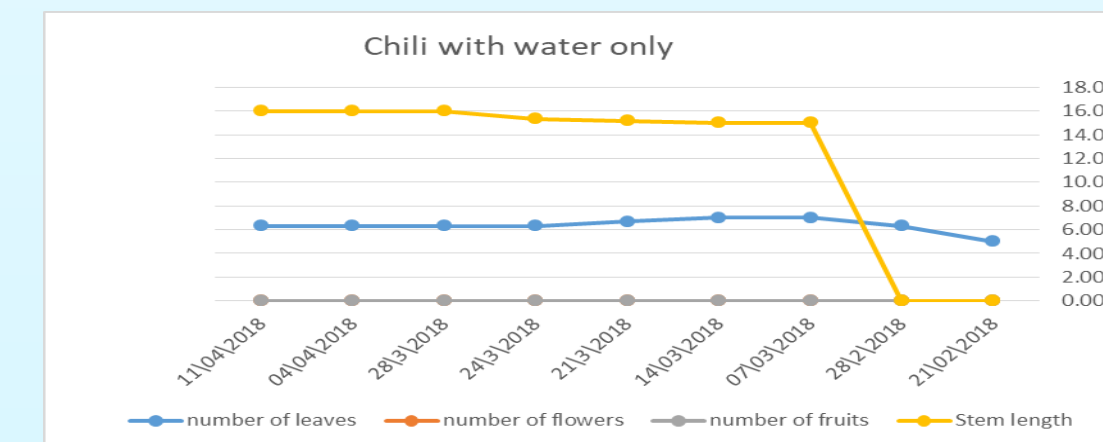
Graph1: The effect of fish waste (aquaponics) on the growth of chili.



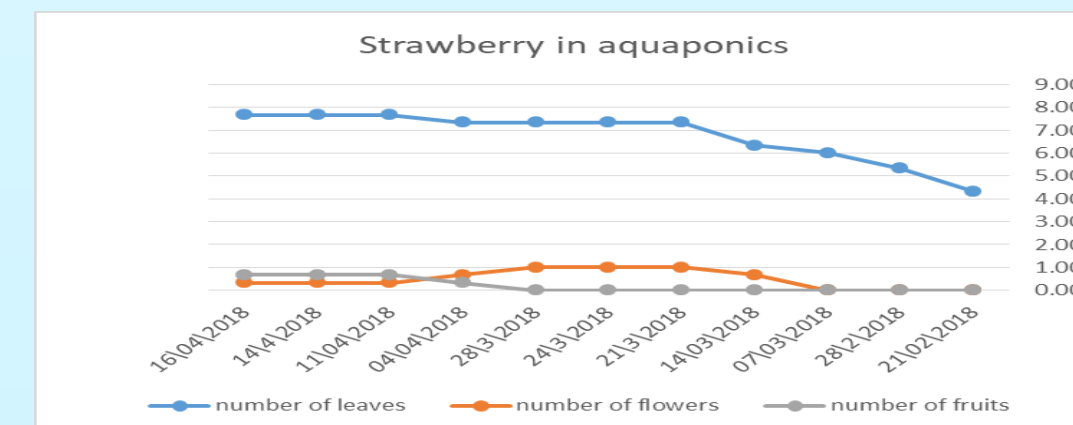
Graph2: The effect of fertilizer on the growth of chili in hydroponic culture.



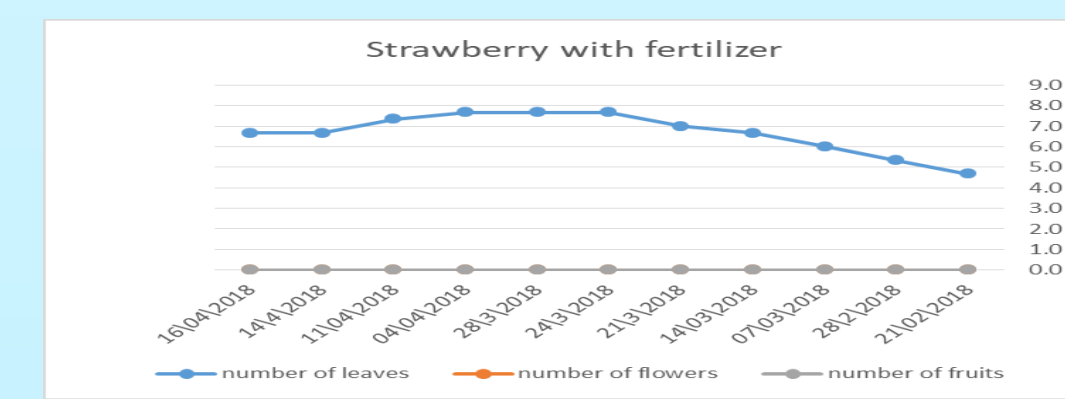
Graph3: The effect of planting in water only(without fertilizer) on the growth of chili.



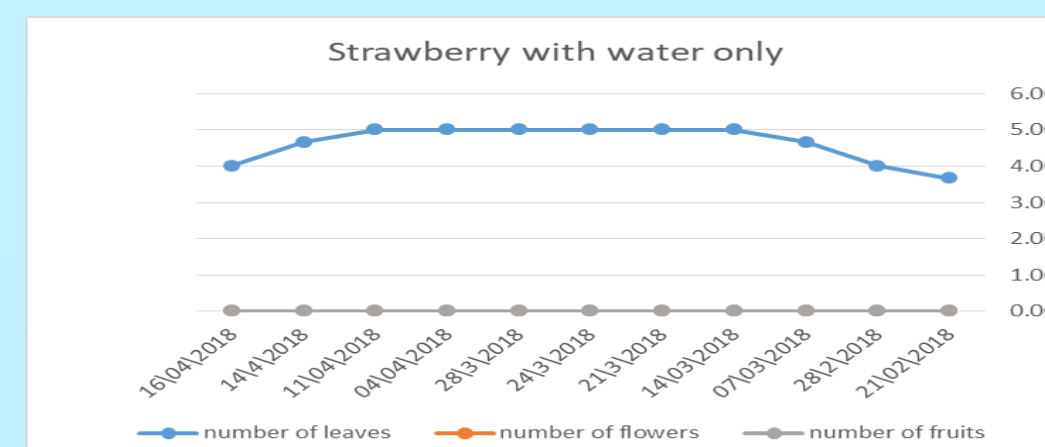
Graph 4 : The effect of fish waste (aquaponics) on the growth of strawberry.



Graph 5: The effect of fertilizer on the growth of strawberry in hydroponic culture.



Graph 6: The effect of planting in water only (without fertilizer) on the growth of strawberry



Conclusion and discussion

Strawberry is one of the best plants for aquaponic, where it grows well and produces flowers and fruits .water only is insufficient for plants to grow, so fertilizers should be added to provide minerals that are essential for growth and are lacked in water. Chili grows better in the system with fertilizers where the number of leaves and flowers and the length of stem was the highest.

Recommendations

1. Repeat the research using different types of plants like tomatoes and lettuce.
2. We observe through our research a clear growth of algae in both the aquaponics and the system with fertilizers, while there was no growth for algae in the hydroponic system with water only, so we recommend making a new research depending on ours to see the reasons

Environmental Implications

Aquaponics is a great alternative to the current farming methods ,and nearly all types of plants grow well in aquaponics, strawberry is one of the best plants for aquaponics. While chili grows better with fertilizer because it provides plants with essential nutrients for growth.

References

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<http://homeaquaponicssystem.com/plants/what-are-the-best-plants-for-aquaponics/>