

Fish Poop: The Future of Farming





Question



Which one will grow plants better – aquaponics (fish) or conventional (soil)?

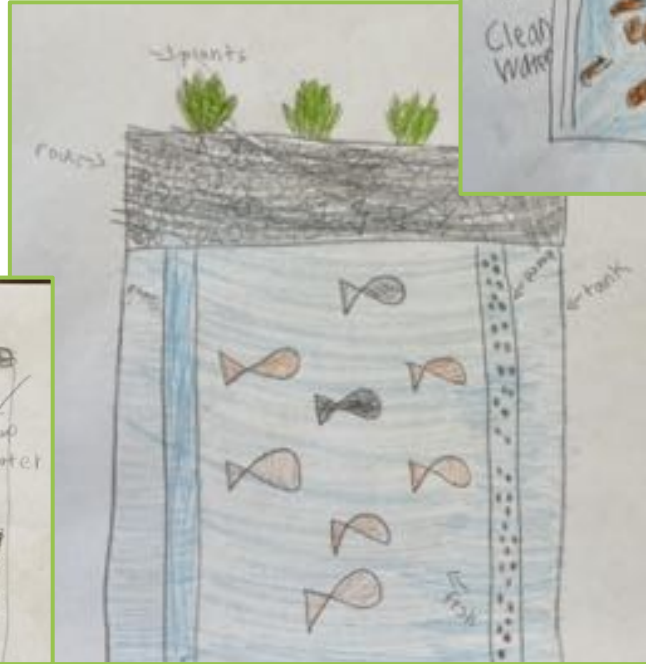
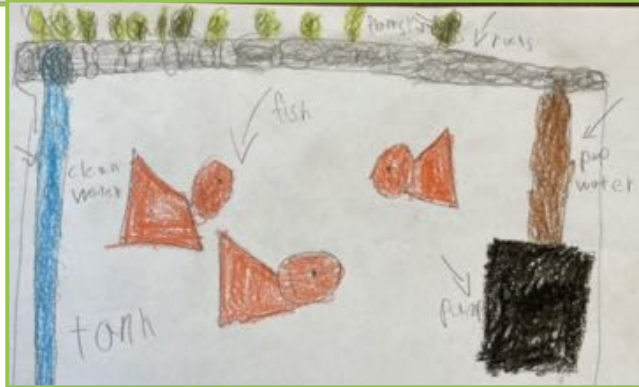
We want to find the best way for our garden plants to grow big and strong!

Research



Aquaponics means we are growing plants in a tank instead of soil. The fish live underneath in the water and the plants are on top growing in rocks. The fish help the plants grow and the plants help the fish grow. The fish poop is in the water that the plants use. The plants get all the germs and poop out of the water so it is clean for the fish. Conventional growing means we are putting the plants in soil like a normal garden would have.

Diagrams of how aquaponics works:



Conventional plants growing separately in soil



Hypothesis

If we grow some plants using aquaponics and some plants conventionally, then most of us think the plants in aquaponics will grow better. We think this is because the fish poop will help the plants grow. The gophers can't reach up there, either (they have been a problem in our garden before).

Some of us think the plants grown conventionally will do better. This is because we have seen plants growing this way in our school garden and they look pretty healthy.

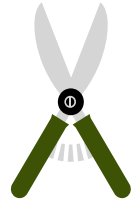
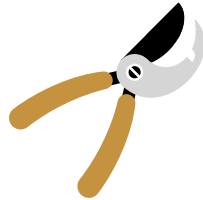
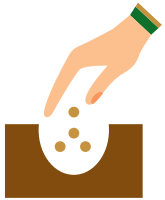
I think aquaponics
will grow best because
I think the fish poop will
help the plants

I think aquaponics
will grow best because
gophers can't get
it.

hypothesis
I think
conventional
is best because plants
are soft.

Materials

- fish (and their poop)
- tank with water pump
- rocks
- water
- ruler
- scissors
- lettuce plants
- soil and a planter box





Procedure

1. Buy lettuce plants from the store
2. Take out of pots and shake off the extra soil on the roots
3. Put 12 plants in the aquaponics rocks
4. Put 12 plants in the soil
5. Cut each plant so it is 8 centimeters tall
6. Wait and wait and wait and wait (3 weeks) until they grow (water conventional plants + check water level of aquaponics + feed fish every day)
7. Measure which ones are tallest and count which ones have the most leaves



Lettuce Measurements - AQUAPONICS		
Plant	Leaf height	Number of Leaves
1	12	10
2	14	10
3	13	15
4	13	15
5	8	8
6	15	7
7	13	10
8	10	12
9	13	13
10	10	9
Total	121	109

Data



Note: 2 plants in each group died after planting, for a total of only 10 plants in each group.

Lettuce Measurements - CONVENTIONAL		
Plant	Leaf height	Number of Leaves
1	10	12
2	10	9
3	11	10
4	10	7
5	11	12
6	12	12
7	12	10
8	11	16
9	11	10
10	8	6
Total	106	104

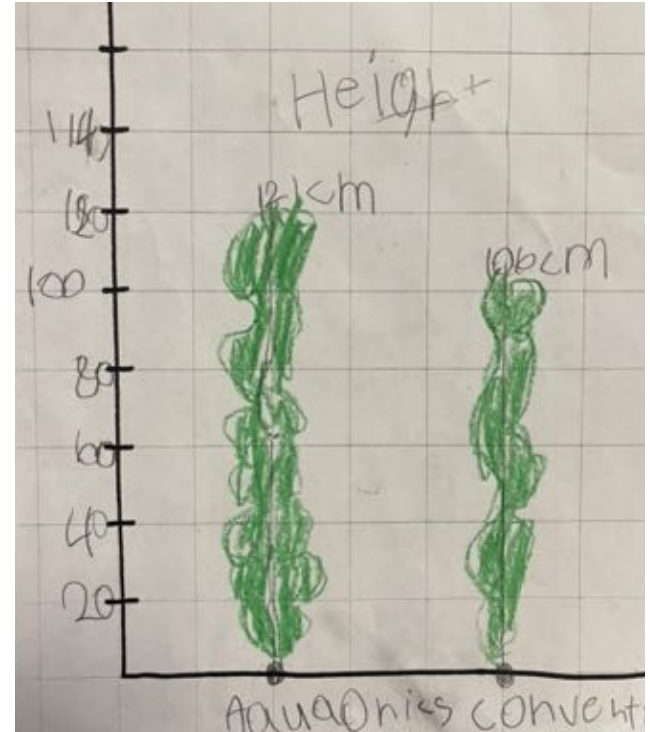
Results

We added up all the heights of the leaves.

Aquaponics had a total height of 121 cm. Conventional had a height of 106 cm.

We added up all the leaves we counted.

Aquaponics had a total of 109 leaves. Conventional had a total of 104 leaves.



It was close, but the aquaponics lettuce grew a little taller and had more leaves!

Aquaponics



Conventional



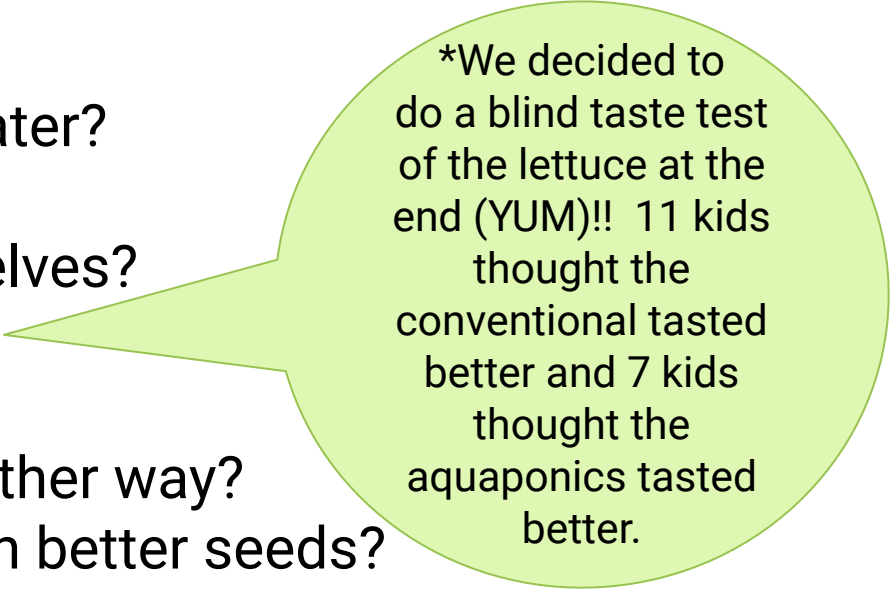
Conclusion

The aquaponics grew better. But both groups of lettuce grew a lot. Maybe the fish poop helped the lettuce grow because it is like soil or vitamins for plants. Also, the aquaponics lettuce might have gotten more water since it was always going through the rocks, so that could have made those plants grow more too. Maybe fish poop will be the future of farming!

Further Questions

Because we are great scientists, we still have questions! Here are some things we are still wondering:

- How much do fish poop?
- Did the plants get too much water?
- Do fish drink?
- How do plants grow by themselves?
- Which one will taste better?*
- How do seeds sprout?
- Do fish help the plants in any other way?
- Did one of the groups start with better seeds?
- Why do people like gardens?
- If fish poop works then would other animal poop work too?



*We decided to do a blind taste test of the lettuce at the end (YUM)!! 11 kids thought the conventional tasted better and 7 kids thought the aquaponics tasted better.

Works Cited

- “Kid Engineer: Growing Plants With Fish.” *YouTube*, uploaded by Design Squad Global, 12 March 2017, www.youtube.com/watch?v=JAN6Tz4lwMA.
- “What is Aquaponics?” *YouTube*, uploaded by Desima Co., 29 July 2016, <https://www.youtube.com/watch?v=PEal63zv-2M&t=32s>.

Special thanks to Mr. Rick Meyer, who set up our aquaponics system and provided the fish to put in the tank. He also feeds the fish every morning!

Slides were created with the help of **Slidesgo** (<http://bit.ly/2PfT4lq>) and **Freepik** (<https://bit.ly/2AB5qGa>)

