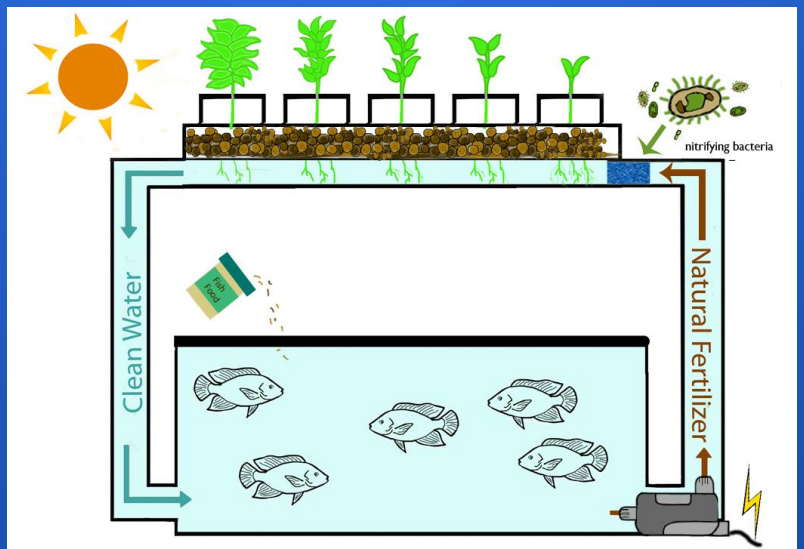
Aquaponics: Which Medium Will Snap Peas Grow Tallest in?



Background information

I will test clay balls, lava rocks, soil and gravel to grow snap peas. Aquaponics is a process for growing plants without soil. It is basically a water garden, where fish and plants work together. They work together because fish make ammonia\fertilizer for the plants to grow faster than soil gardens, and the plants make sure the water is clean. This is a cheaper, faster way of growing plants than traditional soil gardens. Aquaponics is cheaper because all you need is a few fish, a tank, fish food, water and a plant holder.

The seeds I am going to grow with aquaponics are snap peas, Snak Hero and in Latin it is *Pisum sativum.* The fish I will use are feeder goldfish and a betta fish.The light is coming from a southwest facing window in my house. The PH level that's good for snap peas is between 6.0 and 7.0. Goldfish like the pH level to be between 6.5-7.5.

Research Question

In which media will snap peas grow the tallest? When placed in lava rock, clay balls, soil or gravel, my hypothesis is the Snap Peas will grow the tallest in lava rock.

Procedure

1. I collected all of the materials including 5 goldfish
2. I rinsed the media to get off excess dirt
3. I put the tank together and rinsed it off
4. I filled the tank with water, installed the pump, and added the fish
5. I added the pots of Lava Rock, Clay Balls and Gravel to growing area at the top of the tank
6. I planted 9 snap pea seeds in each pot/media, including my soil control
7. I fed the fish and observed and measured plant growth dailly
8. I found the average height by adding all of the plants in each media together and dividing by the number of sprouts measured

Aquaponics System

start

fish

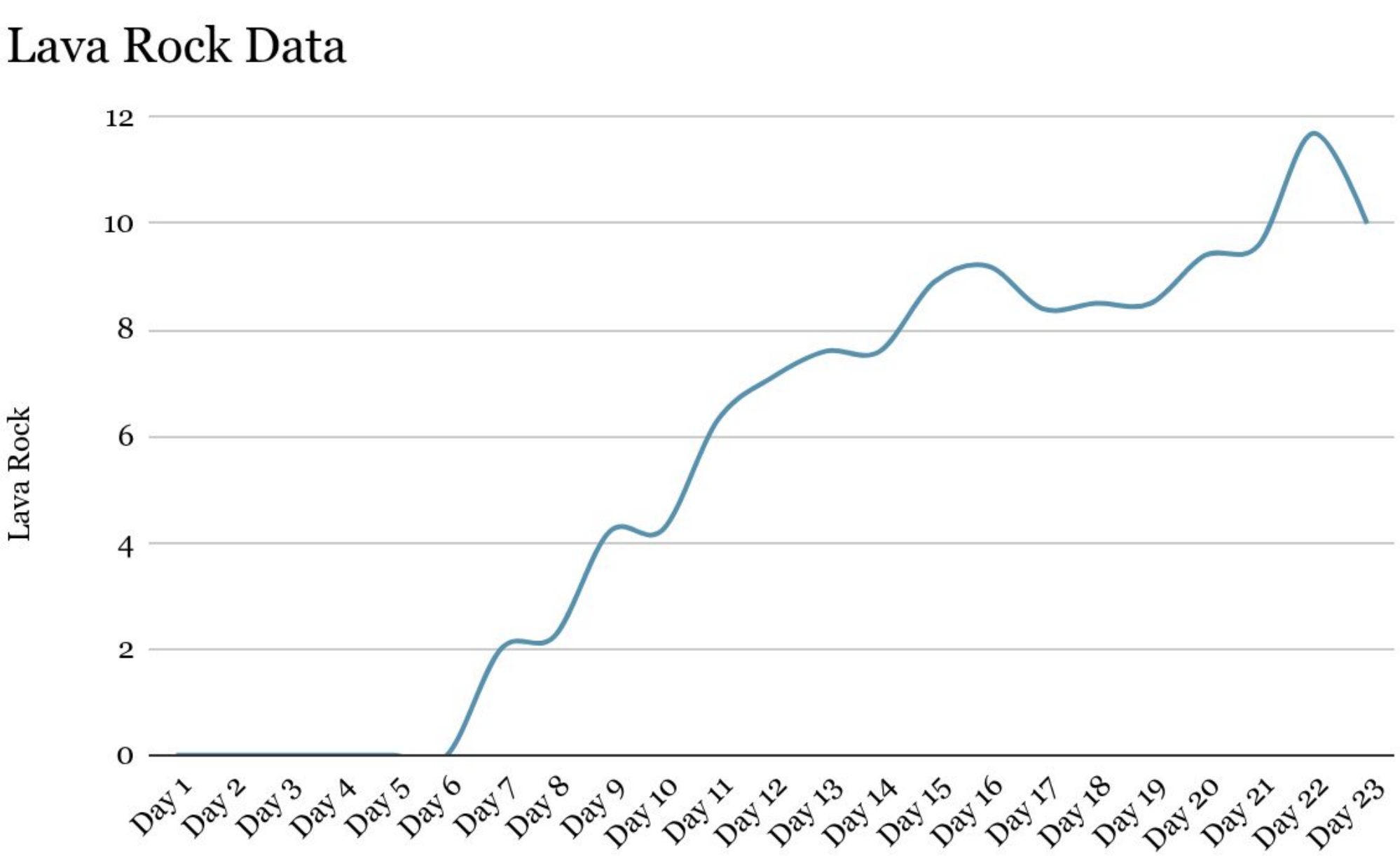
Fish make poop\pee

That fertilizes the plants

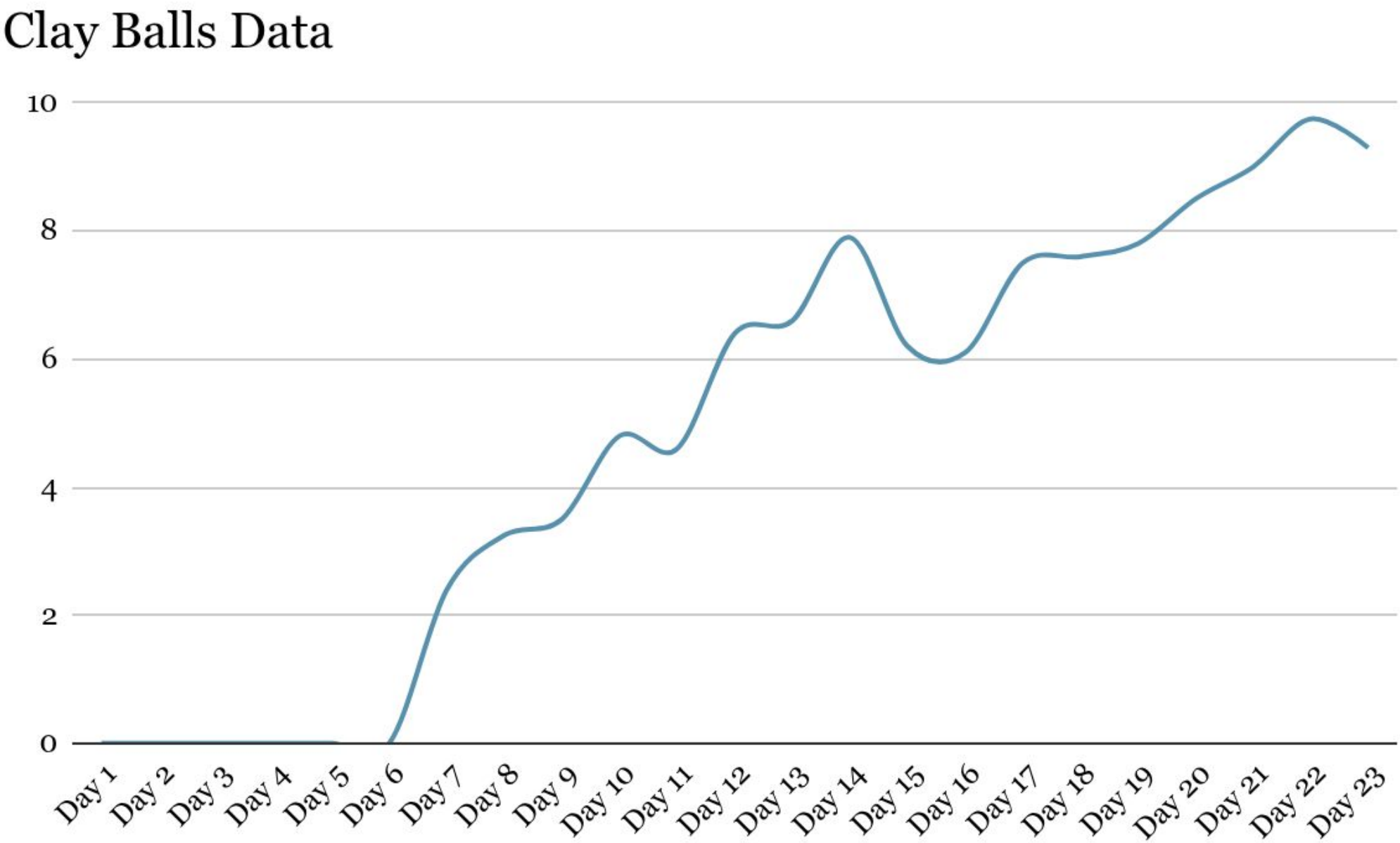
Plants make roots

That feeds the fish

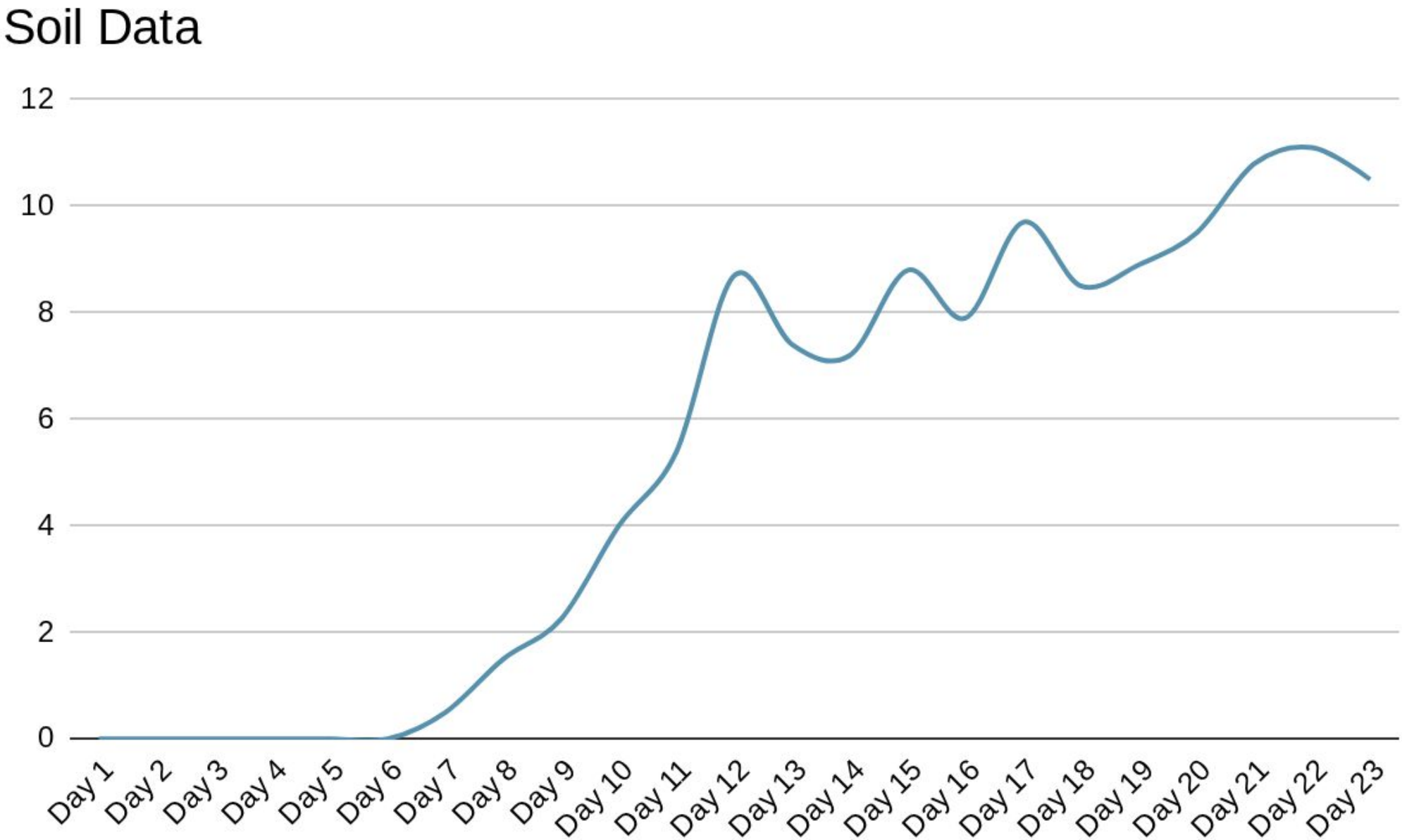
Growth: of Snap Peas in lava rock



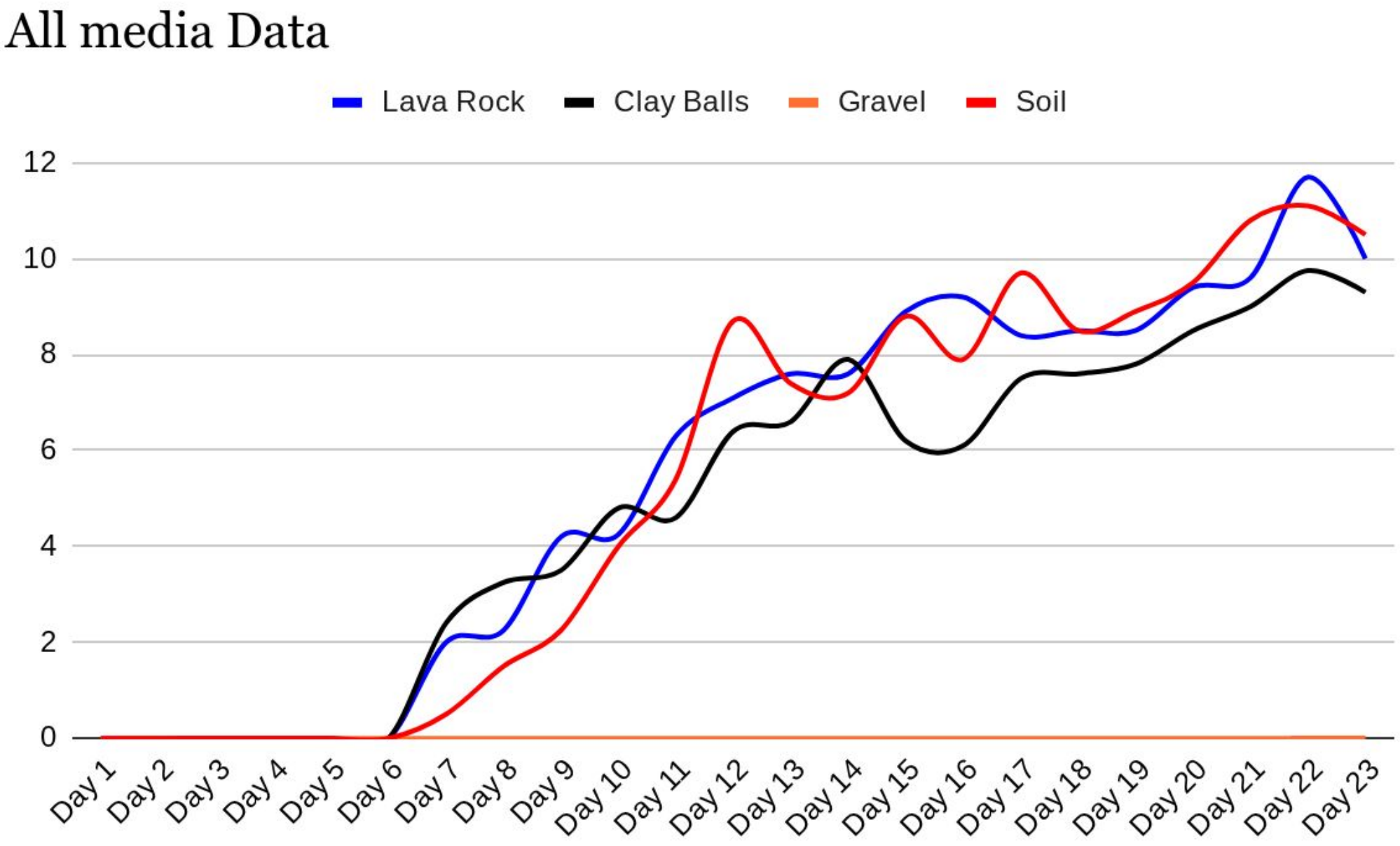
Growth: of Snap Peas in clay balls



Growth: of Snap Peas in soil (control)



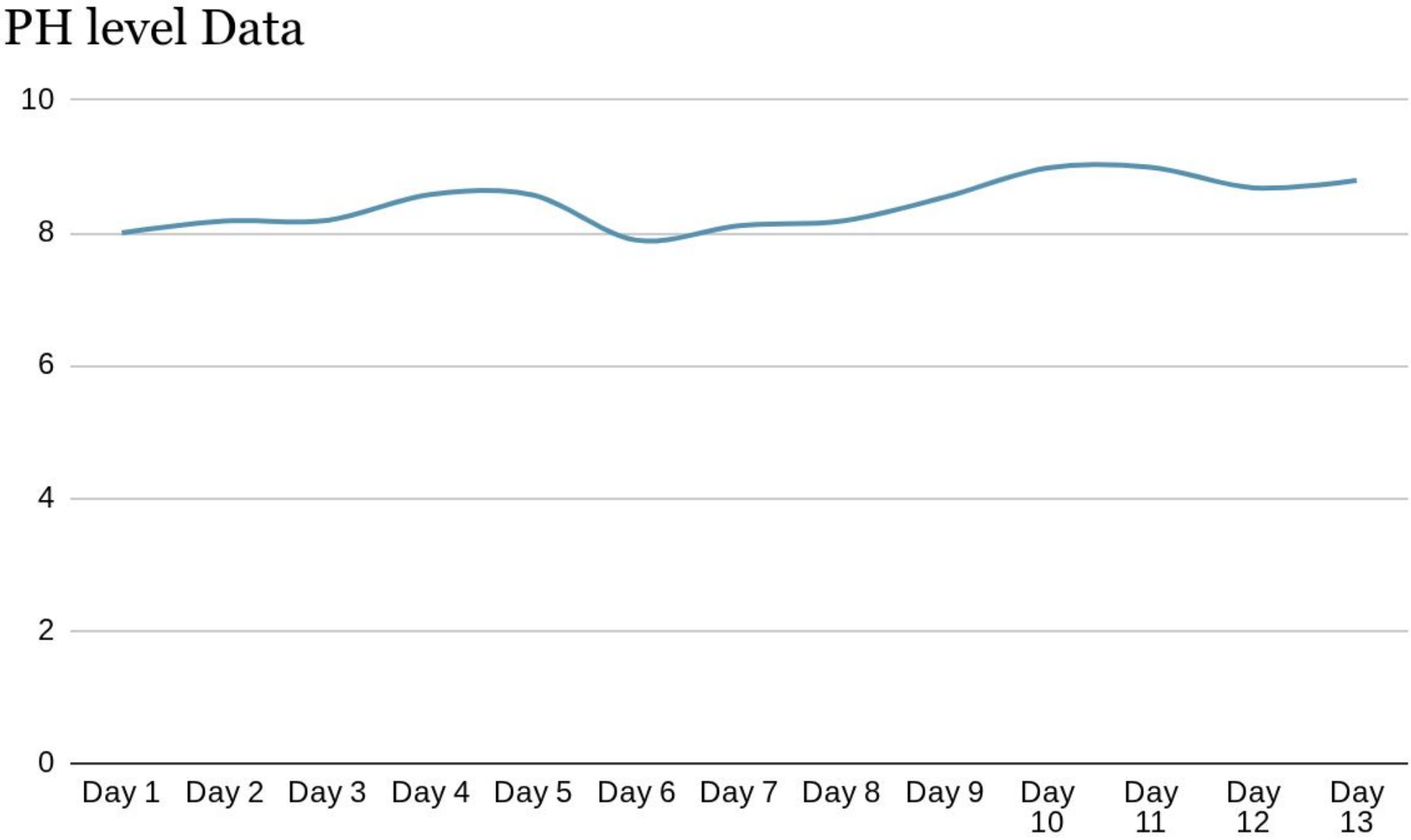
Growth: of Snap Peas in All Media



	Lava Rock	Clay Balls	Gravel	Soil	Ph level
Day 1	0	0	0	0	8
Day 2	0	0	0	0	8.18
Day 3	0	0	0	0	8.19
Day 4	0	0	0	0	8.58
Day 5	0	0	0	0	8.57
Day 6	0	0	0	0	7.89
Day 7	2	2.4	0	0.5	8.11
Day 8	2.25	3.25	0	1.5	8.18
Day 9	4.2	3.5	0	2.25	8.54
Day 10	4.25	4.8	0	4	8.98
Day 11	6.3	4.6	0	5.4	8.99
Day 12	7.1	6.4	0	8.7	8.68
Day 13	7.6	6.6	0	7.4	8.79
Day 14	7.6	7.9	0	7.2	
Day 15	8.9	6.2	0	8.8	
Day 16	9.2	6.1	0	7.9	
Day 17	8.4	7.5	0	9.7	
Day 18	8.5	7.6	0	8.5	
Day 19	8.5	7.8	0	8.9	
Day 20	9.4	8.5	0	9.5	
Day 21	9.6	9	0	10.8	
Day 22	11.7	9.75	0	11.1	
Day 23	10	9.3	0	10.5	

Growth and pH of the experiment

pH Levels of Water Over Time



Why you should do Aquaponics

- It is cheaper than traditional farming
- It grows 30% to 50% faster than traditional farming
- It saves water
- You don't need to buy new soil
- Aquaponics combines raising fish and using fish waste to naturally fertilize plants, producing both fish and plants

Discussion and Interpretation

In a summary, it was fun to watch the plants grow and question things about this project.

The project ended early because all the fish died, likely because the pH of the water was too high. Toward the end of the project, I began monitoring the water's pH.

When I do this project again, I will monitor the pH of the water more and do more water changes, to prevent the fish and plants from dying.

Conclusions and Ideas for Future Research

Next time, I should monitor the pH level more than I did in this project, I think that is why all of the fish died. One reason I think the pH level went up was because we had too many fish at the beginning, so next time I will use one fish for the whole time.

References

I got references from

- EcoGro on 657 W St Marys Rd, Tucson, AZ 85701 Phone: (520) 777-8307
- https://www.youtube.com/watch?v=JAN6Tz4HwmA
- https://www.youtube.com/watch?v=cqKoVlm3laU