**Quarter 3 Project:**

***Aquaponics Data Technical Report***

Throughout this quarter, you have been collecting data to evaluate the health of the aquaponic ecosystem that you built for your Quarter 2 Project. Some of you have been monitoring chemical speciation (pH, nitrates, potassium, etc.) while others may have been investigating plant traits to assess the health of your ecosystem. For this Quarter Project, you will be organizing your findings into a technical report and submitting it to Canvas by March 7, 2024 at 11:59p. Technical report must be submit using “Technical Report Template” example below. You will be evaluated using the rubric found on the next page.

**Project Rubric**

|  |  |
| --- | --- |
|  |  |
| **Language** | Language is informal, written in active voice, or has numerous grammar/spelling issues |  | Language is formal, written in passive voice, has few grammar/spelling issues |
| **Abstract** | Abstract lacks background, results, or methods |  | Abstract discusses background, results, and methods in a concise manner |
| **Methods** | Methods are vague. Difficult to replicate experiment without assistance  |  | Methods are detailed. I could replicate your experiment solely using this report |
| **Results/Discussion** | No significant finding presented or implications discussed |  | Most important finding clearly presented along with an inference made from results |
| **Table** | Table is disorganized and not captioned |  | Organized tabulated data is presented with a caption describing table |
| **Figure** | Figure does not support significant finding |  | Figure built from tabulated data supports significant finding and is captioned |

**Succession Report**

**Abstract**

In this experiment, the rate at which plants in the aquaponic tank would grow was measured. This was measured by measuring the plants on top of the tank with a ruler and observing the creatures and plants in the tank. *Cyperus eragrostis* grew the most but *Persicaria lapathifolia* was a close second. Though *Cyperus eragrostis* is native to the southwestern U.S., most grasses grow fast so its rapid growth could be attributed to that.

**Results & Discussion**

*Cyperus eragrostis* grew the fastest due to it being native to Arizona and a grass. *Persicaria lapathifolia* isconsidered native to Arizona, and it does well in moist places, so it makes a good fit for aquaponics. *Nasturtium officinale* was introduced to Arizona, *Nasturtium officinale* is an aquatic plant so growing in aquaponics could support it well. It grew fsteadily and towards the end of our observations had a jump up in growth.

*With the introduction* of water from the river, many things started appearing, such as *Lemna minor bugs and snails, and little sprouts growing from the bottom of the tank*.

*Lemna minor* is not a native species to Arizona but when it was introduced it spread throughout the tank rapidly. The *Lemna minor* began to get brown and reduced the amount that was in the tank. The small sprouts rapidly spread as well but by week 8 they had all disappeared. It was sporadic when bugs were there but were recorded whenever they were seen, that goes for all the sizes of snails too, sometimes there was lots to see and sometimes there was none.

**Table 1:** Growth of plants and animals occupying the tank

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | W1 | W2 | W3 | W4 | W5 | W6 | W7 | W8 | W9 | W10 |
| Cyperus eragrostis (cm) |  | 16.3 | 16.3 | 16.7 | 17.3 | 18.1 | 21.5 | 24.2 | 27.2 | 27.5 | 27.5 |
| Persicaria lapathifolia (cm) |  | 7 | 7 | 10.6 | 11.5 | 12.8 | 14 | 14.1 | 14.4 | 17 | 17 |
| Nasturtium officinale (cm) |  | 1.8 | 1.8 | 2.2 | 3 | 3.3 | 3.3 | 4 | 4.3 | 4.5 | 8 |
| Lemna minor (%) |  | 0% | 0% | 8% | 8% | 6% | 5% | 5% | 6% | 5% | 5% |
| Bug |  | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| Bug on wall |  | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Tiny Snail |  | 0 | 0 | 0 | 0 | 1 | 3 | 4 | 2 | 0 | 8 |
| Small sprouts (%) |  | 0% | 0 | 0 | 0 | 12% | 12% | 10% | 0% | 0% | 0% |
| Teen tiny snail |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Snail |  | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |



Graph 1: Measures of plant growth



Graph 2: % of *Lemna minor on top of water*

**Methods**

To conduct this experiment aquaponic tanks were observed to determine how the chosen plants were growing. Every week the data about the plants, water and state of the tank were recorded on a piece of paper. The plants were measured with a ruler in centimeters(cm) and written as such. The state of the tank was estimated by observation; the fish, snails, sprouts growing from the bottom, and *Lemna minor* and written in percentages*.*