

Oyster Mushrooms Influence On Crop Productivity



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Introduction

Oyster mushrooms have the potential to eliminate soil borne pathogens and make nutrients available more rapidly due to its Mycorrhizae. Mycorrhizae are a vast network of underground fungal hyphae that improve soil conditions by metabolizing organic matter and mobilizing nutrients within the soil for root uptake, thus making them a sustainable option to boost nutrient availability as opposed to fertilizing as well as a soil treatment.

Research Question

Do Oyster Mushrooms have the potential to be a sustainable method of revitalizing recycled soil and creating a considerable difference in productivity of crops?

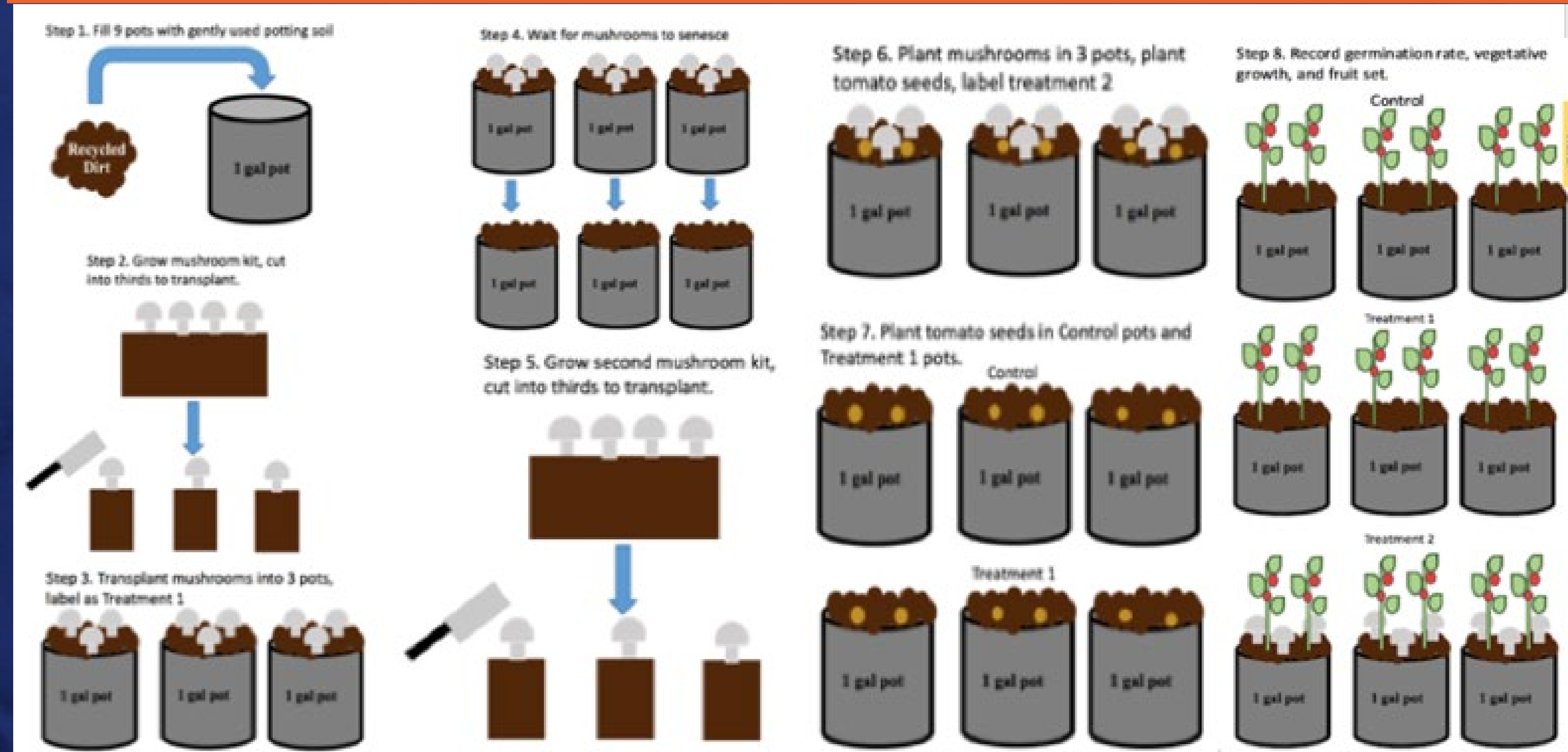
Hypothesis

If you grow tomatoes post Oyster Mushroom senescence it will cause crop productivity to increase at a more rapid rate than it would using an intercropping method or no Oyster Mushrooms at all.

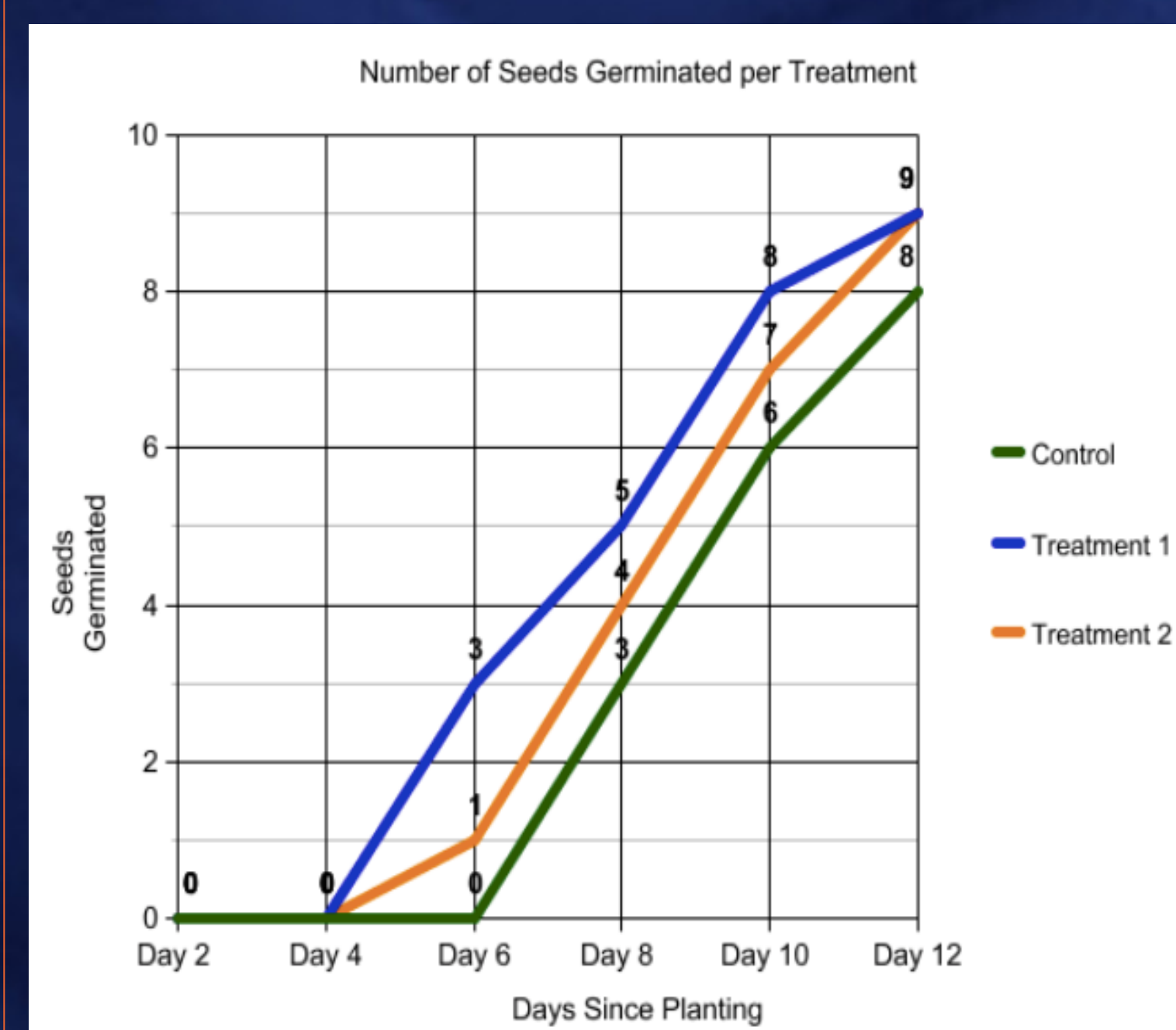
Materials

- 9 1-gallon pots
- Gently pre-used soil
- Tomato seeds (approximately 3 per pot, I used Everglades Tomato Seeds)
- 2 Oyster Mushroom grow kits
- Water
- Cutting Board
- Measuring apparatus (tape, ruler, etc.)
- Pot labels
- Knife
- Sharpie (for labels)
- Notebook
- Pencil
- Camera

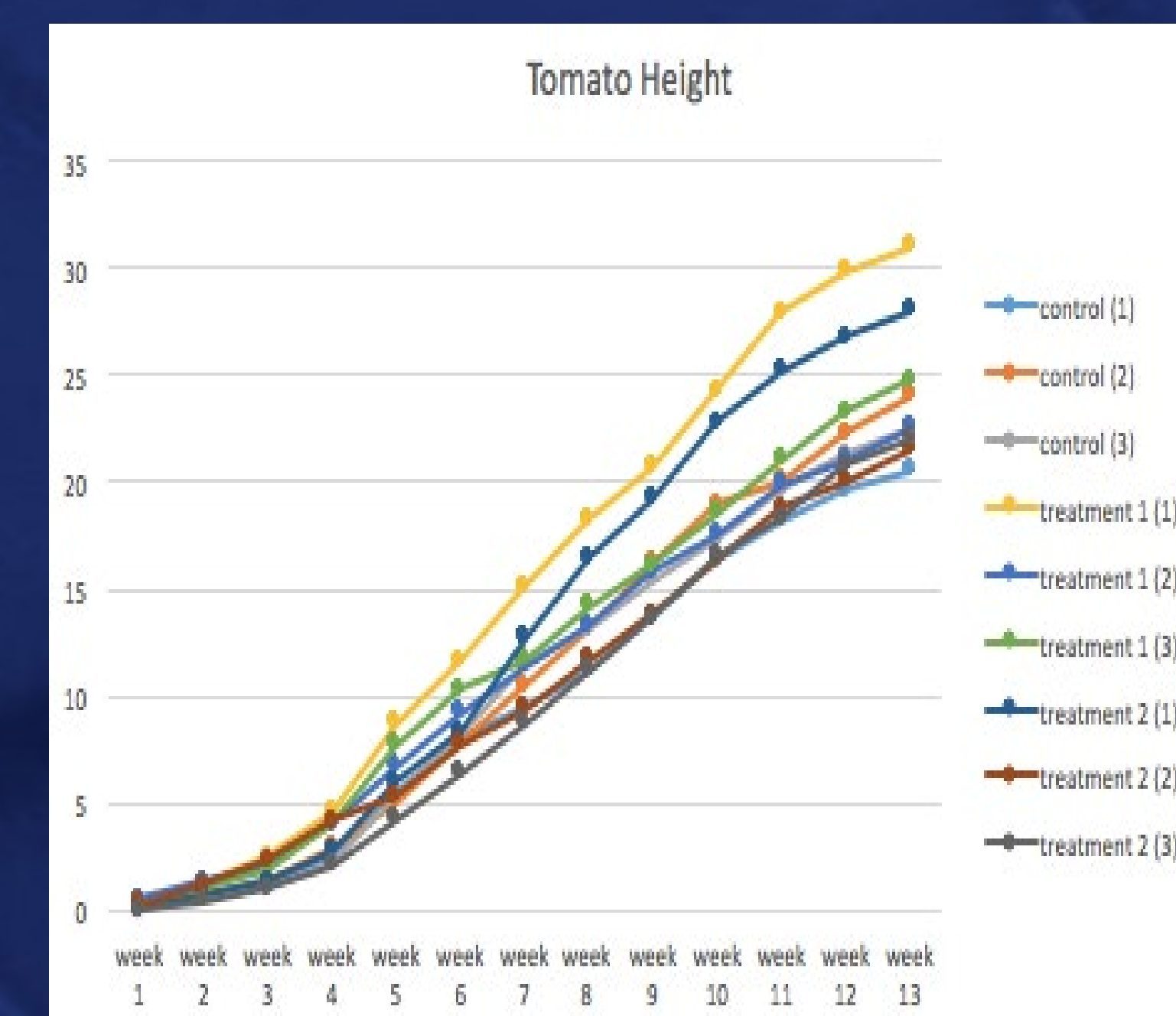
Methods



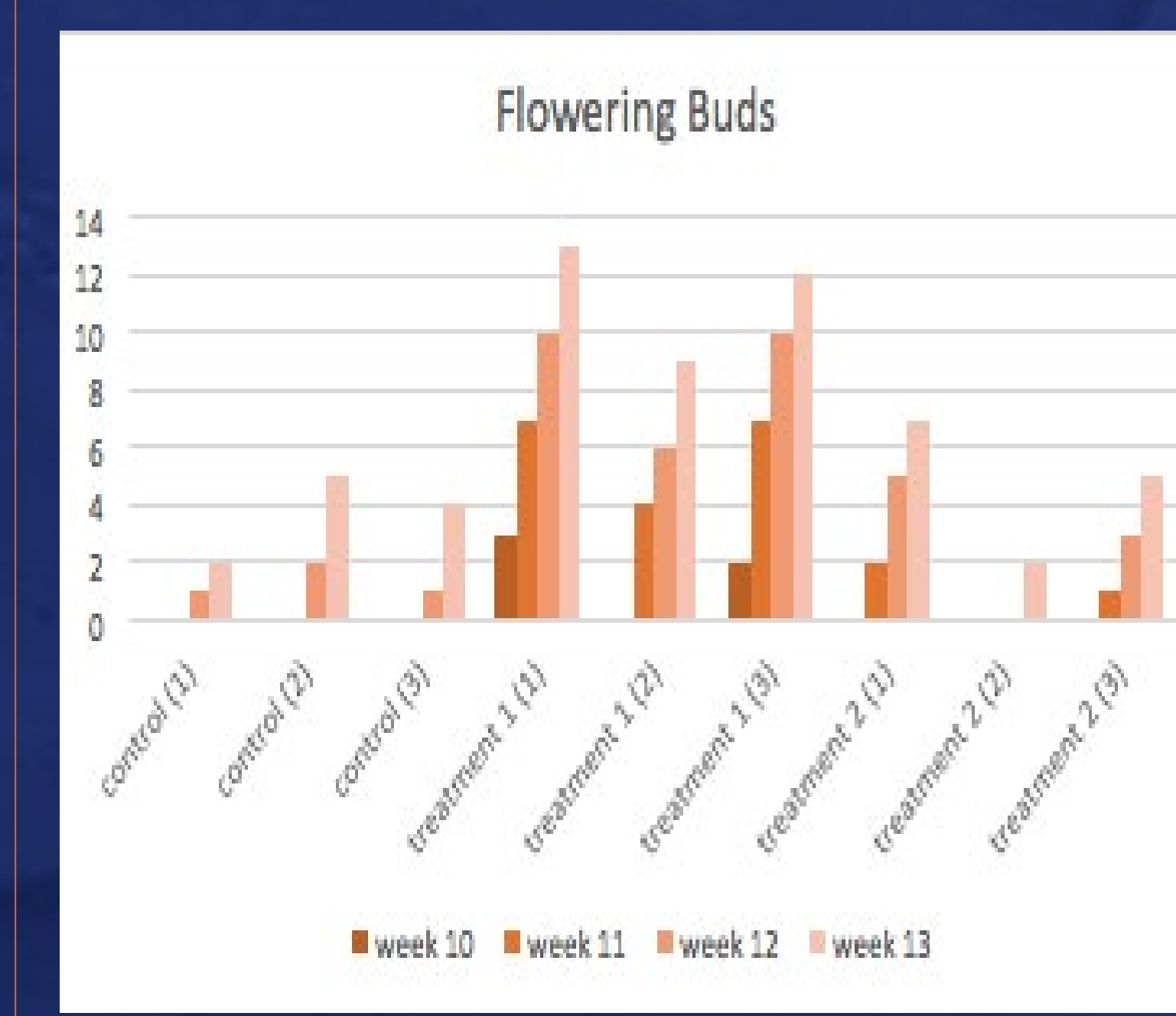
Results



- All treatments and controls germinated with a slow start
- Treatment 1 started at a rapid pace, followed by treatment 2 with the control following.



- Treatment 1 excelled in the beginning of the growth season
- Treatments 1 and 2 had similar height patterns at the end of the growing season with 1 plant in each treatment growing above average.



- Treatment 1 produced flowering buds the quickest out of all of the trials.
- Treatment 1 has a significantly higher production rate than Treatment 2 and the control.

Discussion

- The data shows that tomatoes grown in soil post-mushroom senescence did substantially better than both the tomatoes grown without mushrooms or simultaneously with mushrooms.
- Based on the literature, one could expect that the senesced mushrooms in Treatment 1 mobilized the nutrients prior to decay therefore readily supplying the tomatoes with nutrients ("Farmers of Fungi", 2021).
- One could also expect the mycorrhizae in Treatment 2 to increase the surface area of roots and enable greater nutrient uptake, but the soil was used prior to the experiment so nutrients were not readily available and what was left prior to planting may have been scarce (Yang, et. al., 2020).

Limitations:

- Lack of light exposure to Treatment 1 & 2 due to shelving and trees
- More exposure to rain water to outer plants & control shelf

Conclusions

- Experiment is still ongoing— everglades tomatoes are late summer plants and produce 80-90 days after sprouting
 - Actual fruit set will be counted after harvest
- Treatment 1 had significantly higher productivity than all other treatments
 - 34 buds total in Treatment 1, compared to 14 buds in Treatment 2 and 11 buds in the Control.

Implications:

- Growing tomatoes after mushroom senescence does improve productivity, future research needs to be done on the benefits of mushrooms in relation to other crops.
- In the future, Oyster Mushrooms could be used as a method in sustainable agriculture or in home gardening

Works Cited:

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- Yang, X., Yang, W., Sun, L., Qi, X., Song, F., & Zhu, X. (2020). Impact of Maize-Mushroom Intercropping on the Soil Bacterial Community Composition in Northeast China. Retrieved March 21, 2021 from <https://www.mdpi.com/2073-4395/10/10/1526/pdf>