Effects of Earthworms on Potted Plant Growth

Carlie Meehan

Introduction

According to a meta-analysis by Zhenggao Xiao, earthworm presence in soil increases plant growth by 20% (Xiao 2017). This experiment was designed to test if adding earthworms to potted plants would cause a positive change in average height of the produce being grown, to provide more food to those growing the plants.

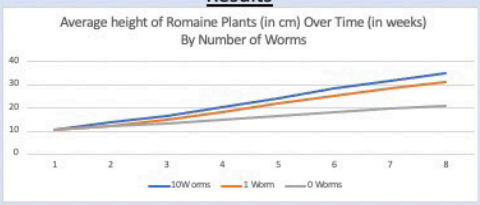
Hypothesis

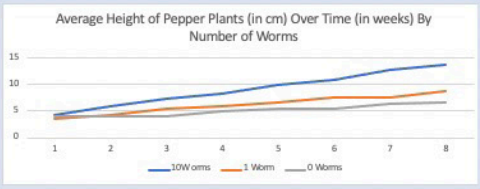
If earthworms are added to potted plants in quantities of 10, 1, or 0, then the potted plants with 10 earthworms will have a greater average height than the other groups.

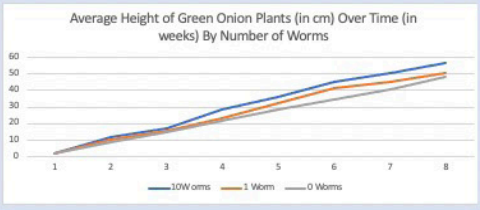
Background Information

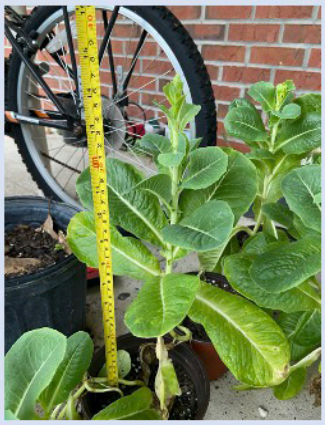
Many people who live in food deserts do not have access to fresh fruits and vegetables, which can be very detrimental to their health and wellbeing. Furthermore, they often do not have access to garden space, and therefore may only be able to plant fresh produce in pots. Earthworms are known to help plants grow, so the addition of earthworms to potted produce may help them grow more quickly, providing more nutritious food at a relatively inexpensive cost.

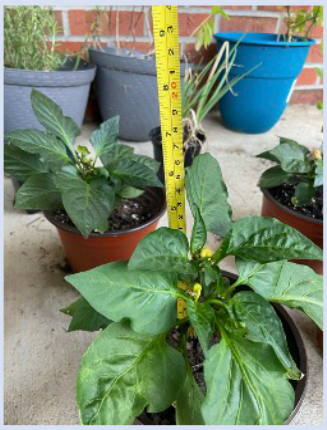
Results



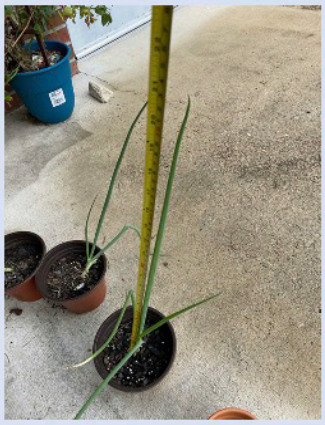


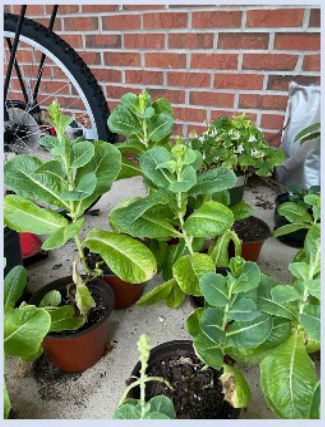






There was a greater average height for potted Romaine Lettuce, Bell Peppers, and Green Onions when grown in pots containing 10 earthworms than in the pots containing 1 or 0 earthworms.





Methods

1. Obtain 9 Romaine Lettuce, Bell Pepper, and Green Onion plants, and split each kind of plant into 3 groups: 10 earthworms, 1 earthworm, and 0 earthworms.
2. Pot each of the plants in 6 inch containers, using the same type and amount of soil for each.
3. Add the number of earthworms corresponding with the group they are in (10, 1, or 0).
4. Water each plant using 1000 mL of water every other day or as needed.
5. Obtain the heights of all plants using a measuring tape each week.
6. Average the heights of plants contained in each group per week of data collection.
7. Rotate plant positions each week randomly.
8. Repeat steps 4-7each week for 8 weeks.
9. Compare the average change in height between the plants with 0, 1, or 10 earthworms.

Discussion

The experiment's results supported the hypothesis that the groups with 10 earthworms in each pot would have a greater average height than the other groups of 1 or 0 earthworms per pot. In each type of produce, the average height of the plants containing earthworms was taller than the other groups. This is important, because the addition of earthworms is relatively cheap, and long-lasting method of increasing plant productivity, as the earthworms will reproduce over time and continually enrich their environment. According to the USDA, earthworms provide several key benefits to the plants they live with, including improving nutrient availability soil drainage and soil structure, and plant productivity (USDA). This research indicates that the addition of earthworms may be an affordable option for people in food deserts to gain more nutritious food at home, while using a relatively small amount of space, such as container planting. In the future, experiments showing the effect of earthworms on different species of edible plants could be useful to further study the impact of worms on home gardens.

References

USDA. (n.d.). Earthworms. Retrieved November 12, 2020, from https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/biology/?cid=nrcs142p2_053863

Xiao, Z., Wang, X., Koricheva, J., Kergunteuil, A., Bavon, R., Liu, M., . . . Rasmann, S. (2017, September 11). Earthworms affect plant growth and resistance against herbivores: A meta-analysis. Retrieved November 12, 2020, from https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2435.12969