Effect of Soil Type and Fertilizer on Plant Growth

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Introduction

If we grow sunflowers in sandy and silty soil and add a slow release fertilizer, which will have better growth? Will the sandy soil have enough compactness to keep nutrients in? This experiment was done to determine which soil is more effective to grow plants in. The team hypothesized: if we add fertilizer to sandy soil, the grains in it will cause leaching of the fertilizer before it can be taken up by the plant compared to that of silty soil which will hold in the fertilizer. Figure one shows week four of our experiment.

Image 1: All plants before harvest (Week 4)

Conclusions

- ❖ This experiment did not yield any significant results, probably because there were a lot of variation within groups and several outliers.
- ❖ However, the graphs suggest that the plants growing in silty soil held in the fertilizer better than the sandy soil, which makes sense in terms of the known ability of silt to hold onto mineral ions.
- ❖ More replication and better control of the initial variability of each group will help to provide definitive answers to this question.

Results and Discussion

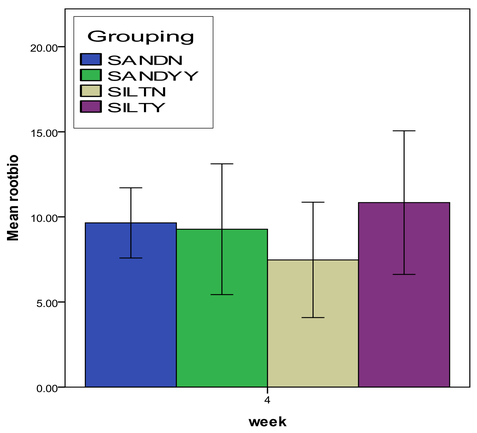

Figure 1
At the end of week 4 the root biomass was taken. Silty soil with fertilizer had the heaviest weight for root biomass. (fig. 2)
This soil type had more nutrients to the soil which provide larger growth.

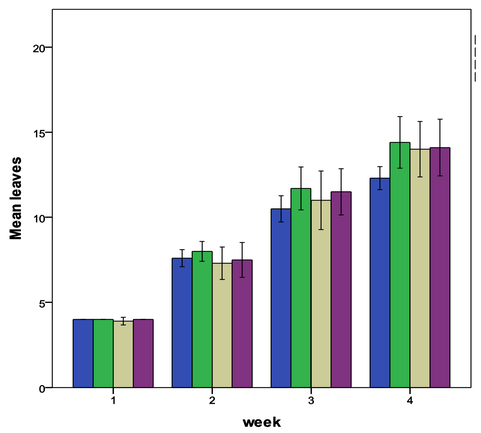

Figure 2
The number of leaves varied the least.
In weeks two, three, and four we see that the two groups with fertilizer have a larger production of leaves. (fig. 3)
This data does not support our hypothesis.

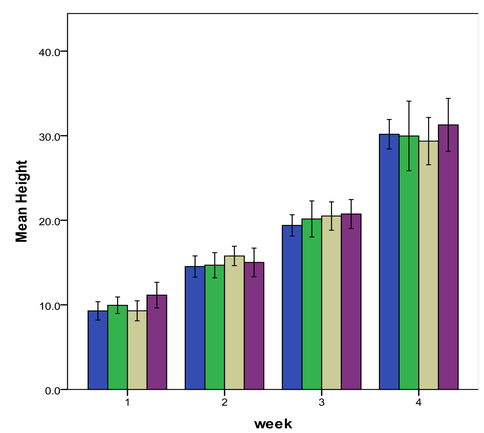

Figure 3
The height of the plant was taller in the silty soil with fertilizer. (fig. 4)
The error bar shows that this data is not significant enough to support the hypothesis. (fig. 4)
As weeks went on we notice that the silty soil with fertilizer keeps the lead, we just do not have enough evidence to support the hypothesis.

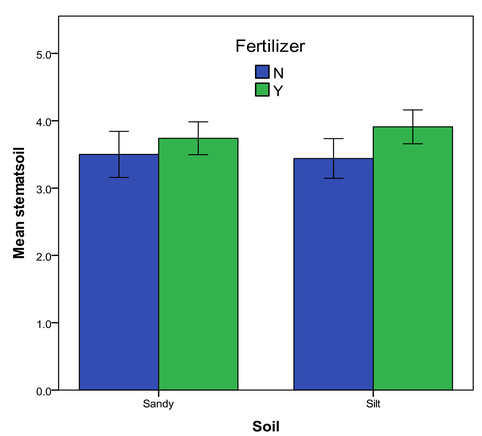

Figure 4
The diameter of the stem at soil was significantly larger in the silty soil with fertilizer. (fig. 5)
The data in figure 5 supports our hypothesis being that the silty soil held in more nutrients than the sandy.
To improve on the data I think that we should grow plants over a longer period of time in order to see larger growth differences.

Materials and Methods

- ❖ Sunflowers were grown in 4 different treatment groups
- ❖ 50 percent sand with a slow release fertilizer and one group without. Another group with just silty soil with fertilizer and again one without.
- ❖ Every week, plant height, root biomass, shoot biomass, and number of leaves was measured.

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