Ally Jo Salomon

Dr. Lehman

BIOL 309

3/10/2020

Plant Nutrition Lab Report

In this experiment, the shoots and roots of each treatment group was different compared to the control, which was the complete solution. The -K group compared to the control had shorter roots and smaller shoots. Potassium is important to the plant because it guards cell regulation of stomates, which may have negatively affected this group due to the lack of this nutrient. As for -Mg compared to the control, the roots were longer, and the shoots were smaller and slightly wilted. This may because magnesium is a component of chlorophyll, which gives the plant color. The -Ca plant group were all dead compared to the control and other groups. This may be because it is a component in many processes like cell walls and cell volume control. The -P group compared to the control had long roots, shoots were green, and had less branching. This may be because phosphorus is used to make ATP, which is used for energy in the plant. Lastly, the -N group compared to the control had long roots, more branching, and small shoots. This group was the smallest of all plants, except for the dead -Ca group. In plants, nitrogen is an important component of amino acids, which may have affected the plants nutrition.

The leaf area data showed that no potassium, phosphorus, magnesium, nitrogen, and calcium had a significant difference compared to the control (Figure 1). Calcium especially stood out because it had no leaves to measure (Figure 1). As for shoot weight, all of the nutrients had significant difference compared to the control. Calcium especially stood out because it had a very low weight. The root weight data showed that there was significant difference between the control and calcium. Phosphorus and magnesium were slightly significant, and nitrogen and potassium were not significant compared the control. As for total plant weight, all nutrients had significant difference compared to the control. Also, the control had the highest mean in all data sets, which means it produced the least amount of error compared to the other values in the data set.

My original hypothesis for no calcium was that “without calcium the plants growth will be reduced”. The results did not support my hypothesis because all of the plants died without calcium. Each nutrient has a function in the plant and calcium showed significant results. This may be because it is involved in gene expression, component of cell wall, maintains cell membrane, etc. This nutrient is in many processes that plants need, which may be why all of the plants died. As for nitrogen, it’s an important component of amino acids, which gives cells their structure and function. As for phosphorus, it is an important component of ATP, which is the “energy unit” of plants. Potassium is also important to plants because it regulates when the stomata close and open, which may have been why the leaves had some dead spots. Lastly, magnesium is a component of chlorophyll, which may be why the leaves were wilted and had a few dead spots. Each nutrient is important to plants and the results showed this. The control group had the best results because it was a complete solution, which proves plants need all of their nutrients to successfully live.

**Figure 1.** Shows the difference in leaf area compared to the control. All nutrients were significantly different compared to the control.