Minerals and Nutrient Deficiency in Plants

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Introduction

The goal of this laboratory experiment is to obtain a greater understanding of plant nutritional needs. Plant growth and reproduction require specific minerals; essential minerals are those that if absent, a plant cannot grow and reproduce. Nutrient deficiency will be able to be assessed in this experiment through indicative signs within the plant.

Materials

16 nutrient solution containers
2 germination flats containing potting soil
30 bean and 30 corn seeds
Nutrient deficiency solutions as outlined in Tables 1 and 2

Procedure

1. Plant approximately 30 bean and 30 corn seeds in flats containing sterilized potting soil.
2. Prepare 16 1.0 L containers that will used for each nutrient solution treatment.
3. After one week, transfer two or three seedlings to the appropriate nutrient solutions as indicated in Tables 1 and 2.
4. Observe and record data for each of the treatment for a period of 3 to 4 weeks.
5. Use the deficiency symptoms listed in Table 3 to determine which nutrients are missing.

Results and Discussion:

Table 1. Results From The Plant Nutrient Efficiency Experiment

Treatment	Symptoms
Complete	Both corn and bean survived. Minor deficiencies in corn
Potassium (-K)	Corn is essentially dead.

	Bean is stunted and necrotic.
Phosphorus (-P)	Yellow and green makes me feel like a jelly bean
Calcium (-Ca)	Corn is dead and loot of internal growth Bean looks Grrrreat!
Nitrogen (-N)	Corn looks sad and unhealthy Bean was not planted
Magnesium (-Mg)	Corn is dead Bean has stunted growth
Sulfur (-S)	Corn has yellow younger leaves Bean are dead
Iron (-Fe)	Corn are dead Bean are dead
Water (H2O)	Both plants look fairly okay
Micro Elements	Interveinal corrosion

When comparing all the plants after the experiment was complete it was clear that the complete group was the most successful. Iron is vital to plant growth, as seen from the plant when we remove iron both plants were brown and dead. The plants with just water were somewhat successful. Both plants exhibited a relatively decent growth rate. When we took calcium out, the bean exhibited great growth but had a negative effect on the corn.

Conclusion: In conclusion this experiment that lasted over weeks proved that without certain nutrients, like us, our green plant brethrens cannot probably develop into that awesome oxygen producing machine. It was clearly evident by the physical appearances of our corn and soybean plants, that they suffer. Some plants were yellow on the verge of death and others were stunted. So, in other words, to probably develop a plant. We must provide it with all of its require resources or it will not grow or lead to the death of the plant.

Pictures:

Figure 1. Here is the corn ready for planting for the nutrition experiment!

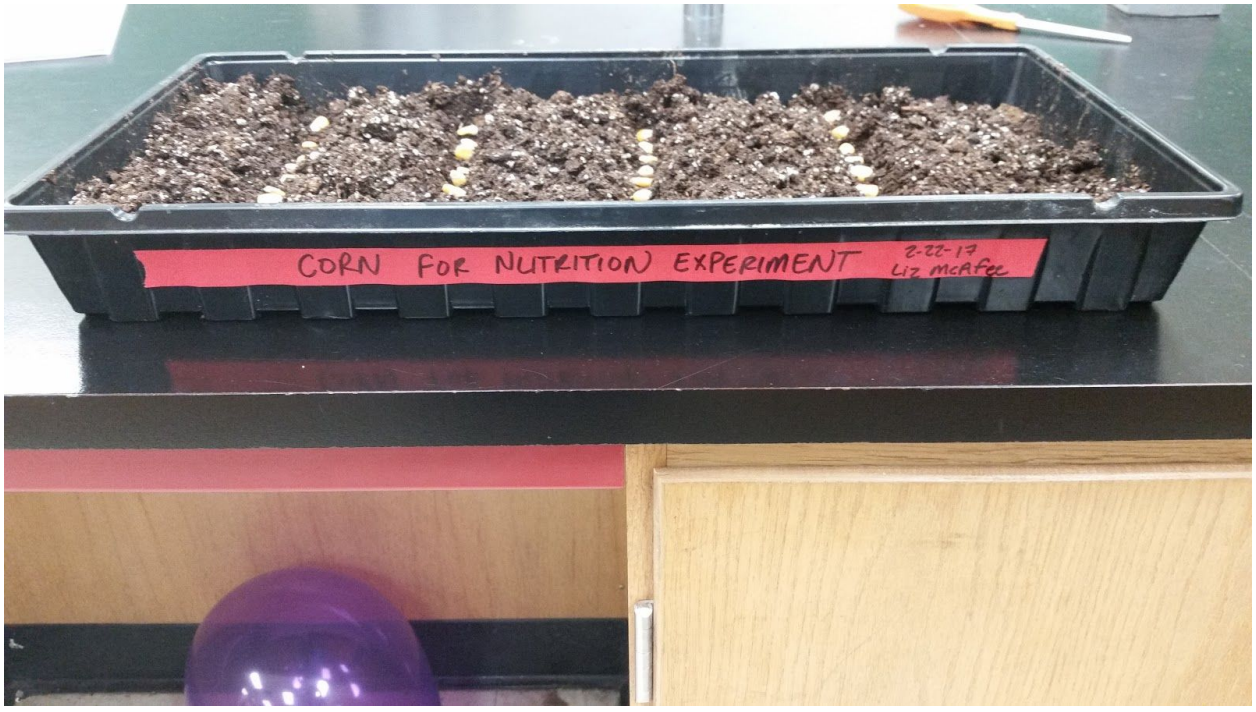

Figure 2. Another angle of the corn getting ready to be planted for the experiment. Notice the date 2 - 22 - 2017 and planter Liz!

Figure 3. In this picture we can see all the soybeans excited to grow and be experimented with!

Figure 4. Here are the soybeans again with the label indicating the date we planted and who planted them (props to Madison!). Also pictured are a pile of plastic animals Dr. Bidlack distributes to students who receive A's on tests.

Figure 5. Here are the plants after six weeks of growth in their respective nutritionally deficient environments.

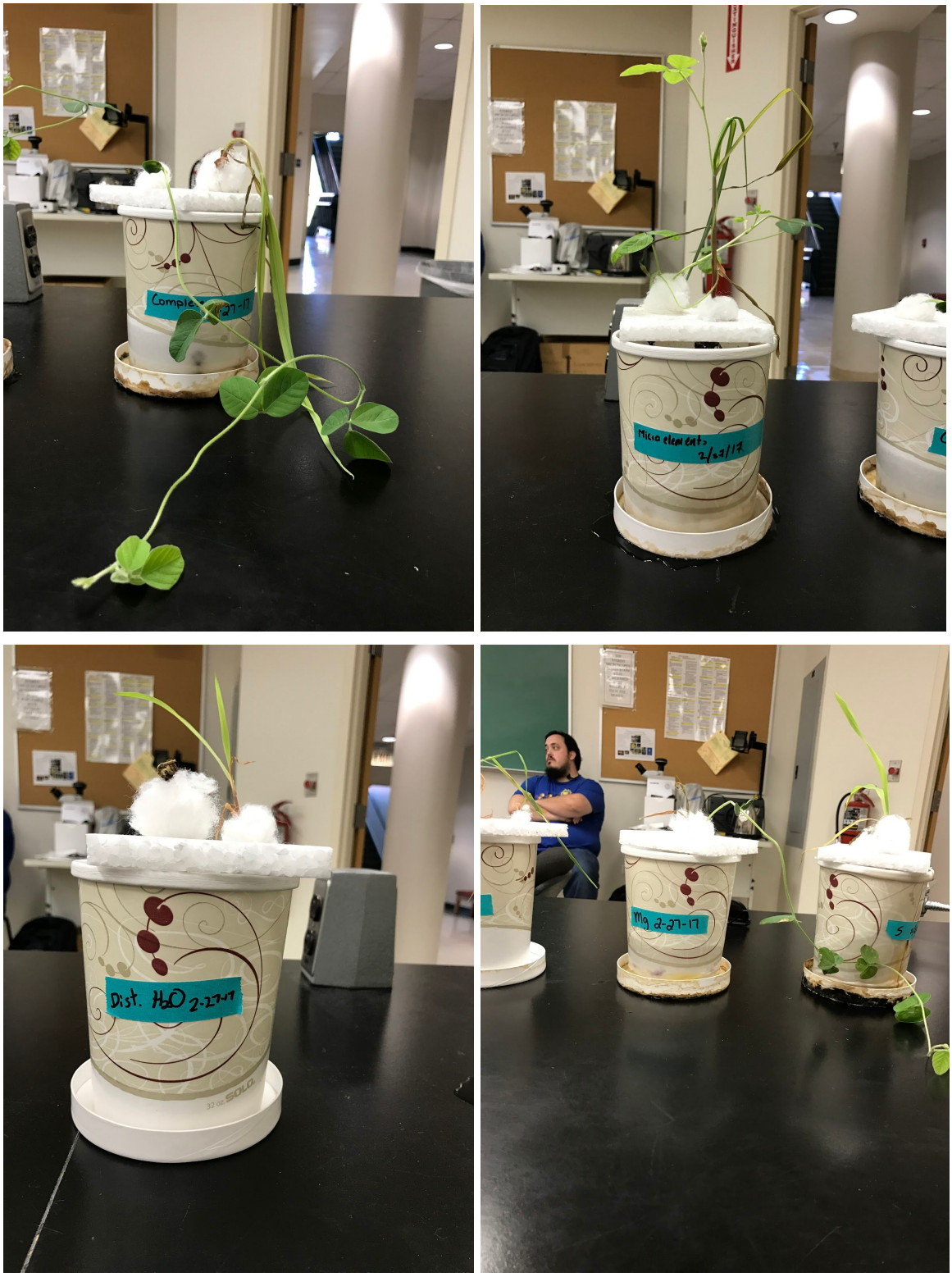

Figure 6: This image shows the plants with compete nutrients (upper-left) microelement deficiency (upper-right) just distilled water (bottom-left) and magnesium deficient(bottom-right).

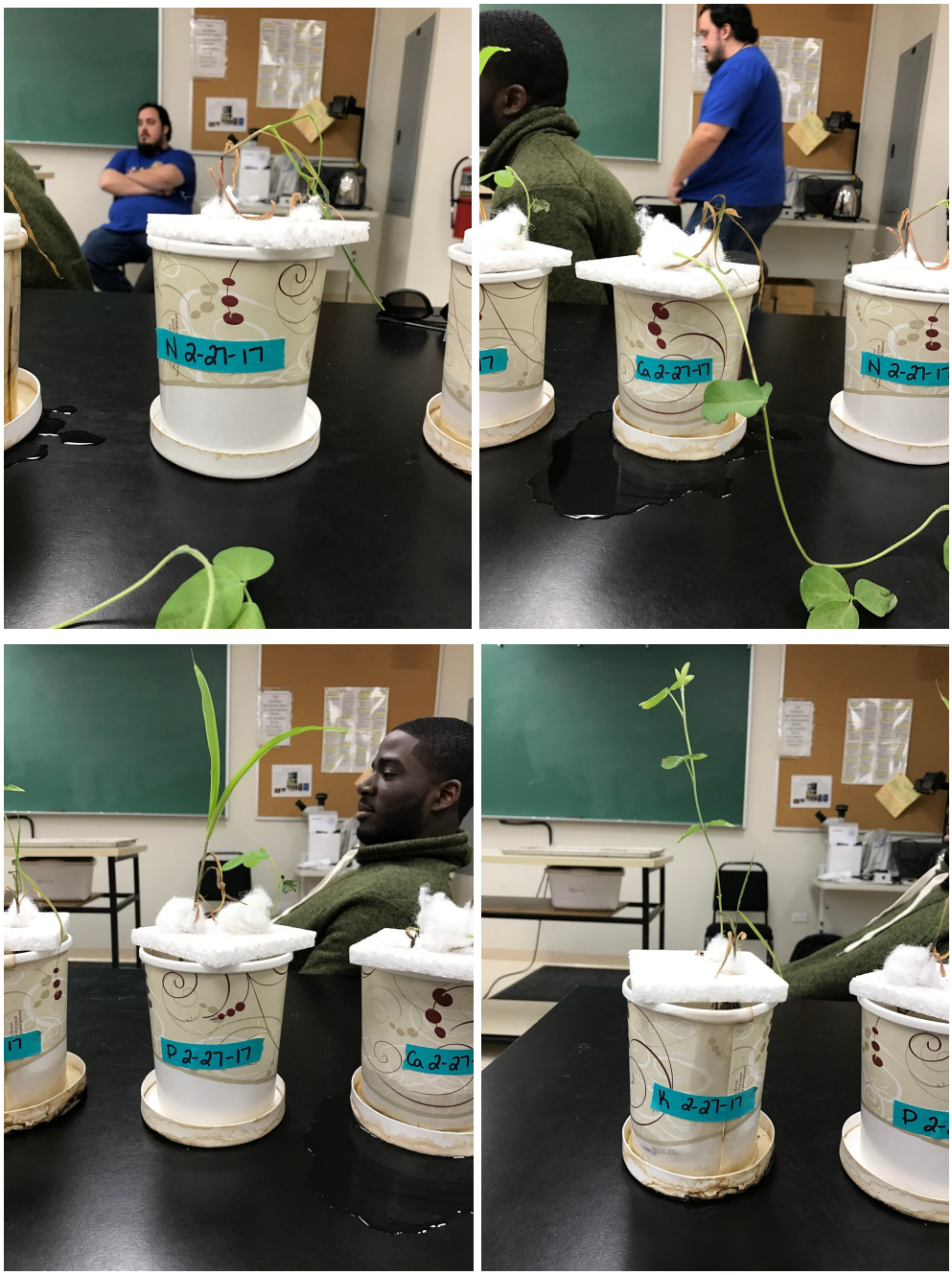

Figure 7: This image shows the plants with Nitrogen deficiency (upper-left) Calcium deficiency (upper-right)Phosphorus deficiency (bottom-left) and Potassium deficiency(bottom-right).