Maggie's Breathtaking Botanists PlantingScience Journal

2/22/24-

Today we worked on completing our research question and experimental design. We also worked on our predictions as well. Our research question stated, "How much salt can plants tolerate before they can no longer tolerate it. We wanted a way to save freshwater for other necessary things like drinking. If the plants can grow with salt water then we don't need to use fresh water to water the plants." Our prediction stated, "We think that the plants will be able to tolerate small amounts of salt in the water for a certain amount of time before they are not able to survive and grow. The salt may affect the plants but they will continue to grow. It may immediately mess with the growth and the survival of the plant. This will happen because plants don't typically grow with salt water. If the plants can survive any salt while they're sprouts, then we will increase the salt even more drastically to find the level of salt they cannot tolerate. We think this will happen because plants are not designed to use salts in their life functions.

3/4/24-

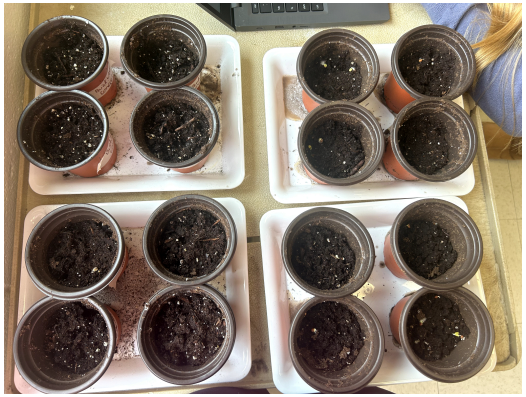
Today we will begin to plant the seeds in pots. We first put the soil in each of the pots so that the soil is the same amount for each. We then soaked each of the pots completely with water so they were very moist. Next, we put five seeds of each type for its assigned pot, and covered them all with a thin layer of soil. Finally, we arranged them neatly on the counter in trays and took a picture of them.

Our experimental design states "Materials -Eight containers of buckwheat - about ten seeds per pot -Eight containers of radish - about ten seeds per pot -Eight containers of peas - about ten seeds per pot -Grow lights to mimic sunlight -Salt -Water -Soil -Teaspoon -Pots -Liter bottle How It Will Work -Peas will be spaced a few inches apart and a thin layer of dirt on top. -Buckwheat will be spaced a few inches apart with a thin layer of dirt on top. -Radishes will be spaced a few inches apart with an extremely thin layer of dirt on top. -Peas, buckwheat, and radishes will get about seven to eight hours of sunlight per day. We will dilute salt in a lot of water, then we will increase the amount of salt after a few days. -We will be measuring the salt in teaspoons. -We will be measuring the water in liters. -The control will have 0 teaspoons of salt per 1 liter of water. -The low amount of salt water will have 1 teaspoon of salt per 1 liter of water. -The medium amount of salt

water will have 3 teaspoons of salt per 1 liter of water. -The high amount of salt water will have 6 teaspoons of salt per 1 liter of water. -The soil will be soaked in water completely before we put the seeds in the pots.”

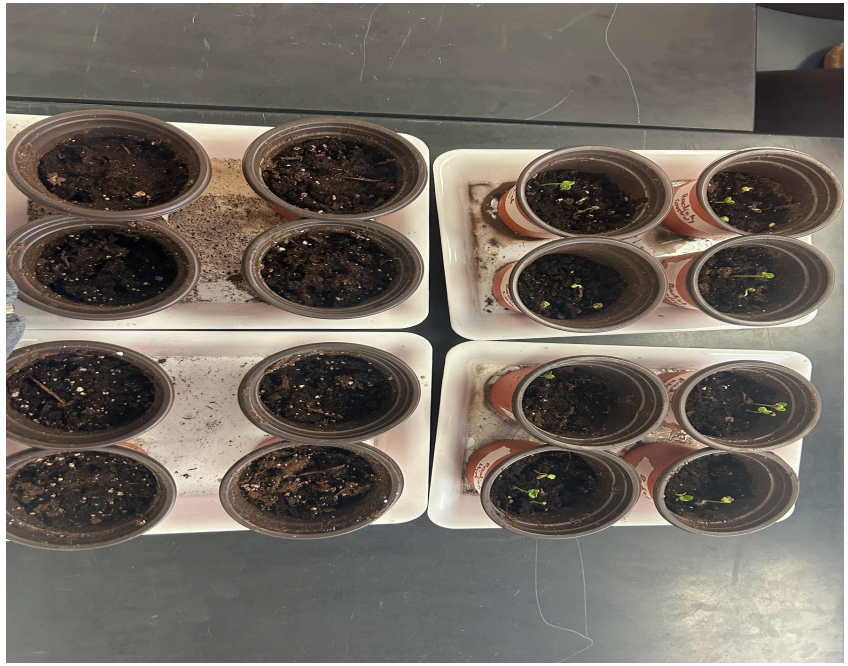
3/7/24-

All of our plants were left alone for four days untouched. The radishes started to sprout, with approximately two or three sprouts per pot, and they were around 1 cm tall. The buckwheat plants have not sprouted yet. Before we add the salt water, we are going to let them grow a little more. The soil in the pots all have a moisture level of 10, so we did not water them at all. We also started to mix the different levels of salt water, the low, medium, and high. We created a table that will hold all of our observations, and we took a picture to upload to our planting science project page. Two of the radish sprouts looked like they had some mold on them, and all of the sprouts were a pale light-green color.



3/8/24-

Today we checked on all of the plants again. We also finished mixing up the high, medium, and low salt concentrations, and filled in our data table for today. Since the buckwheat plants were not growing, we moved them into the sunlight more so that they could grow. The radish plants have grown lots overnight, and they are light green with a little bit of brown on top. A few of the radish sprouts have mold on them. Each of the radish plants have two small leaves.

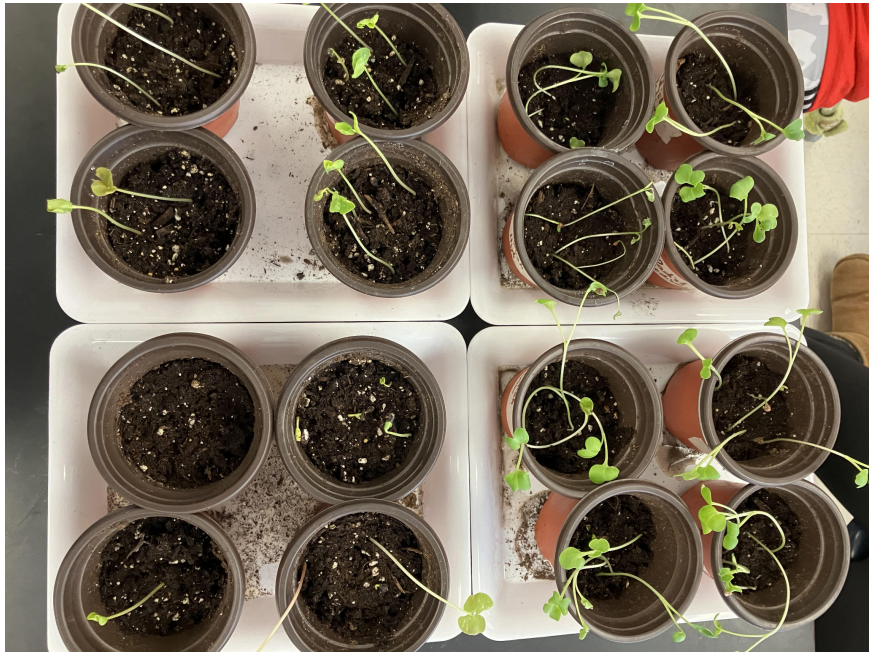


3/11/24-

We looked at our plants today, and they have grown a lot over the weekend with lots of sunlight. We watered them all, giving them each ¼ cup of their designated type of water. They are all light green, with a darker green color the closer you get to the soil. Each of the radish plants have two leaves that are almost like a round shaped heart. The buckwheat plants also have two leaves that are a little more round than the radish plant leaves. Some of the shorter plants have the outer shells of the seeds on top of them.

3/13/24-

Today we looked at the plants again and they have definitely grown a lot. The control plants, the low plants, and the medium plants for both of the radish and buckwheat plants seem to be doing well, but the high plants for both the buckwheat and radish look like they were affected by the high salinity of the water they were given. They look like they are a little bit droopy and like they are lacking hydration. We did not water any of the plants today, though, because they all had a moisture level of at least six. For the radish control pots, we had ten total seeds that germinated in both pots. For the radish low, we had eight total seeds that germinated in both pots. For the radish medium, we had nine total seeds that germinated in both pots. For the radish high, we had eight total seeds that germinated in both pots. For the buckwheat control, we had five total seeds that germinated in both pots. For the buckwheat low, we had eight seeds that germinated in both pots total. For the buckwheat medium, we had one total seed that germinated. For the buckwheat high, we had seven seeds total that germinated.



3/15/24-

Today we looked at the plants again, and they have grown a lot since we last looked at them. They all are all a light green color, and have two leaves. The High Salinity Plants for both the buckwheat and radish are still not doing well, most likely because of the high amount of salt that they were given. We also watered them again, giving them a ¼ cup of the specific type of water that they are supposed to be given. The sprouts have also

3/18/24-

We looked at our plants again after having them sit in the sun over the weekend. We also watered them all, giving them a ¼ cup each of their specific water because they have not been watered since Friday, 3/15/24. The highs for both the radish and buckwheat plants seem to be dying, but they are still barely alive. In our data table, some of the plants have decreased in high amounts, and some have increased in high amounts as well. The decreases in height were most likely due to a lack of hydration in the salinity amounts. The increases in height were probably because the plants were given sunlight all weekend, and they were able to grow a lot more. We are leaving them in the sun for one more day/night before we let another group let their plants have a turn in the sun.

3/19/24-

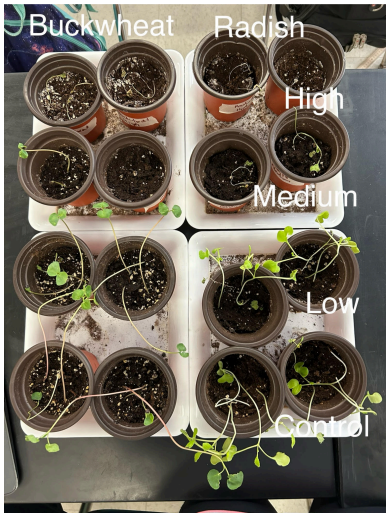
Today we expected to look at our plants on Wednesday instead of today, but we looked at our plants again today, and many of the heights have decreased a lot. Some of the plants have decreased due to the high amount of salt that they were given, and others are just dying in general. Instead of continuing to measure the plants with a ruler, we decided to measure them with a pipe-cleaner instead to be more careful with them. We are not going to water them because we watered them yesterday, and they do not need any today. The buckwheat high plants are still not doing well, but they are still alive. The radish high plants are no longer growing and have died. Each pot has at least 4 plants in them, and we will most likely check on our plants again on Thursday.

3/22/24-

After 3 days of being left alone, some of the mediums, lows, and controls have made a little bit of growth. Most of the high and some of the medium plants have died, but a few of the medium plants are still hanging on. We also watered them, with a ¼ cup each of the specific water. Some of the plants that are dying look as though they have some crystalized salt on top of the soil, around the edges. We looked at the salt that we used (Iodized Salt), and it is sodium chloride. The plants have a ruby red color at the bottom of their stems towards the roots. The salt probably affected the roots of the plants as it was taken up from the soil, causing the plants to die. We will not be leaving the plants in the sun over the weekend, since they were in the sun for the past couple of days.

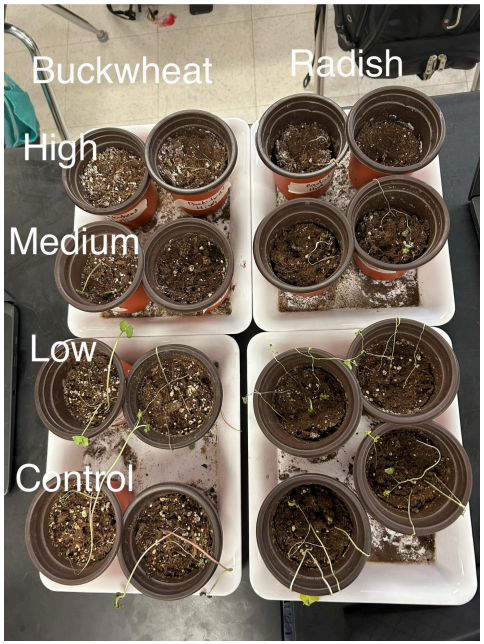
3/25/24-

The plants were sitting on a counter over the weekend, and they were not in sunlight. The school also lost power, so it could have possibly affected the plants because of the temperature. We are not going to measure the plants today, but we will still take observations. We did not give any of the plants water because they were all at 9's and 10's for a moisture level. The radish plants are a more pale light green color, while the buckwheat plants have a light red color closer to the stem, that turns into a pale green the higher up on the plant you look. All of the high plants are officially dead, and only one medium buckwheat plant is still surviving. All of the low plants and control plants are still alive, and some are kinking. We will most likely look at the plants again on Wednesday, and start to make a graph of the heights of the plants.

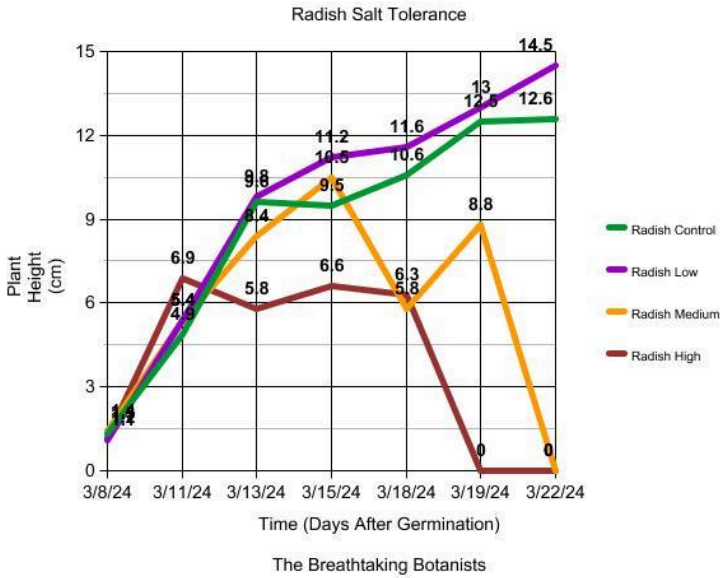


4/1/24-

Due to school technical difficulties, we were not able to come into school and look at, measure, or water our plants. Because of this, all of them have died. Just to see what would happen, we still watered them to see if they may come back to life, but the chances are unlikely. We also worked on our graphs again. On the x-axis, it will be the amount of time after germination, and the y-axis will be the height of the specific plants. We will be making two graphs because we planted and investigated two different types of plants, and it will be easier as well to make two. Today is also our last journal entry, and our last time with Planting Science. Our conclusion states “



Date	Radish Control (cm tall average) Control (0 tsp salt/ liter water)	Radish Low (cm tall average) Low (1 tsp salt /liter water)	Radish Medium (cm tall average) Medium (3 tsp salt/liter water)	Radish High (cm tall average) High (6 tsp salt/liter water)	Buckwheat Control (cm tall average) Control (0 tsp salt/ liter water)	Buckwheat Low (cm tall average) Low (1 tsp salt /liter water)	Buckwheat Medium (cm tall average) Medium (3 tsp salt/liter water)	Buckwheat High (cm tall average) High (6 tsp salt/liter water)
3/8/24	1.3	1.1	1.4	1.2	0	0	0	0
3/11/24	4.9	5.4	5.4	6.9	3	2	4	3.3
3/13/24	9.6	9.8	8.4	5.8	8.2	7.5	7	4.5
3/15/24	9.5	11.2	10.5	6.6	12.4	9.8	9	8.5
3/18/24	10.6	11.6	5.8	6.3	14.4	12.1	5.5	6.5
3/19/24	12.5	13	8.8	Dead	13	9.5	6	3.5
3/22/24	12.6	14.5	1 out of 2 Dead	Dead	14.3	11	6.5	Dead
4/1/24	Dead	Dead	Dead	Dead	Dead	Dead	Dead	Dead


Radish Salt Tolerance
Plant Height (cm)
Time (Days After Germination)
3/8/24
3/11/24
3/13/24
3/15/24
3/18/24
3/19/24
3/22/24
Radish Control
Radish Low
Radish Medium
Radish High
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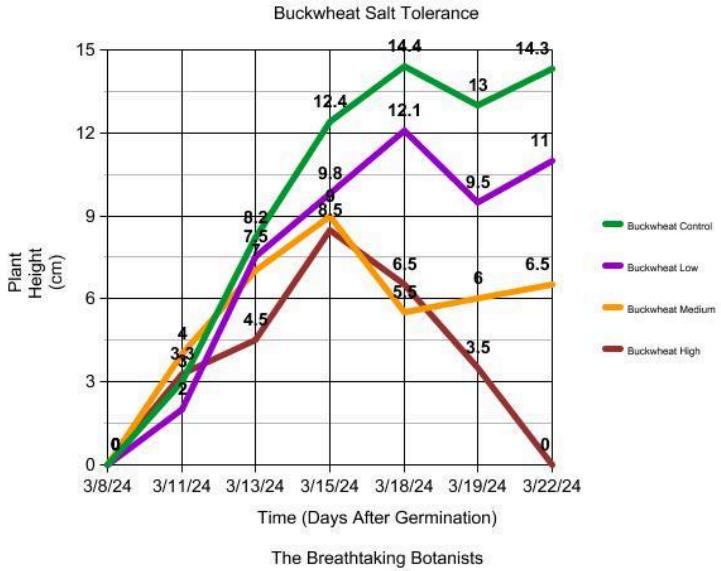
Buckwheat Salt Tolerance
Plant Height (cm)
Time (Days After Germination)
3/8/24
3/11/24
3/13/24
3/15/24
3/18/24
3/19/24
3/22/24
Buckwheat Control
Buckwheat Low
Buckwheat Medium
Buckwheat High
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