

How Does Water Affect the Growth of Plants?

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Chapter: Mendota FFA

State: California

Category: Plant Science



Importance

Why is the topic important to the agriculture industry?

Water is essential to the agriculture industry. The use of water makes it possible to grow fruits and vegetables and raise livestock, which is what agriculture is all about. A decrease in water can cause the agriculture industry to crash. All living things need water to survive. Without water, life as we know it would not exist.

What problem does the investigation solve for agriculture?

Our project solves the problem of the amount of water that plants need to grow. Most places are in a drought and are trying to find ways to keep growing crops with the little amount of water they get. In agriculture, some of the irrigation systems sometimes are inefficient and can cause water loss and runoff. Water is very limited in agriculture and companies will often fight for the river water and also for the water quality. We are trying to find how much water does it take to be able to grow plants that are good quality. Knowing the amount of water that a plant needs can also help reduce the water wasted. For example, when we started our project we didn't know how much water to add and we ended up adding too much.

Other's Work

The "Abstract Article" shows how vulnerability to natural hazards can be measured and analyzes how vulnerability and drought could be related to new agricultural technologies and land tenure in Mexico. Several authors have suggested that the effects of drought on agricultural systems are related both by the technological, economic and political characteristics of a region and by the severity of weather events.



Materials and Methods

1. Soil (sandy or loamy)
2. Water
 - a. 500 ml for set 1 & 2
 - b. 1000 ml for set 3
3. Radish Seeds
 - a. 18 seeds
4. 6 Containers
5. Water container
 - a. beaker and a bucket

Procedure 1

Find the adequate soil type for growing radishes (Deysi)

Sandy or Loamy

Add the same amount of soil to the 6 containers

Get 6 containers of the same size and make sure they are clean. (Fatima)

Wash containers before filling them up with soil.

One partner will then fill up the 6 containers with the soil (Abel)

1 inch deep (Roberto)

Get a marker and measure 1 inch and mark it.

Place the marker inside the soil and use it to get the exact 1 inch depth.

Plant the same amount radish seeds in each of the 6 containers (Monse)

3 seeds in each container

One partner will then get 3 radish seeds and place them inside the hole that has been created with the marker.

Spread out the soil with your hands to cover the hole.

The first day that we plant our radish seeds in the containers each and one of them will receive the same amount of water. (Deysi)

Procedure 2

We will then add different amounts of water to the 6 containers

The 1st set of containers will receive little to no water, and will not be watered that often.

2 to 3 days a week

The 2nd set will be watered normally with the correct amount of water and appropriate watering days.

4 to 5 days a week

The 3rd set will receive a lot of water at a more frequently period of time

5 days a week and 2 times a day

Each watering day the person in charge will take a picture and upload it to the calendar.



Hypothesis/Anticipated Results

Radishes that receive little to no water will eventually stop growing, radishes with too much water will result in drowning and rotted roots and radishes with the normal amount of water will succeed.

Results

	CON. 1 - SET 1	CON. 1 - SET 2	CON. 2 - SET 1	CON. 2 - SET 2	CON. 3 - SET 1	CON. 3 - SET 2	DATE	DAY
NUMBER OF RADISHES	3	2	2	3	No Raddishes	No Raddishes	2/24/2020	6
AVERAGE HEIGHT	1/2"	1/2"	1/2"	9/16"	N/A	N/A		
NUMBER OF RADISHES	3	2	2	3	3	No Raddishes	2/25/2020	7
AVERAGE HEIGHT	3/4"	1/2"	3/4"	5/8"	0.5626 in			
NUMBER OF RADISHES	3	2	2	2	3	2	2/26/2020	8
AVERAGE HEIGHT	0.83 in	1.45 in	0.8 in	0.9375 in	0.54 in	0.375 in		
NUMBER OF RADISHES	3	2	2	2	3	2	2/27/2020	9
AVERAGE HEIGHT	0.9375 in	1.5 in	0.9375 in	1.25in	0.66 in	0.375 in		
NUMBER OF RADISHES	3	2	2	2	3	2	03/02/2020	13
AVERAGE HEIGHT	1.33 in	1.5 in	1 in	1.30 in	1.083 in	0.75 in		
NUMBER OF RADISHES	3	2	2	2	3	2	03/03/2020	14
AVERAGE HEIGHT	1.4167 in	1.875 in	1.2 in	1.45 in	1.1 in	1 in		
NUMBER OF RADISHES	3	2	2	2	3	2	03/04/2020	15
AVERAGE HEIGHT	1.5 in	1.93 in	1.5 in	1.512 in	1.1956 in	1.2 in		
NUMBER OF RADISHES	3	2	2	2	3	2	03/06/2020	17
AVERAGE HEIGHT	1.63 in	2.25 in	1.75 in	1.764 in	1.2	1.33		
NUMBER OF RADISHES	3	2	2	2	3	1	03/09/2020	20
AVERAGE HEIGHT	1.75 in	2.5 in	2 in	2 in	1.25 in	1.5 in		
NUMBER OF RADISHES	3	2	2	2	3	1	03/10/2020	21
AVERAGE HEIGHT	1.833 in	2.35 in	2.24 in	2.25 in	1.456 in	1.6 in		

At the end of our project, our results showed that water is crucial to the growth of plants. Water affects the germination and growth of a plant, so it is important to water a plant with the adequate amount of water it needs.

Discussion

What do the results of the study mean?

The result from the radishes is that the ones that were watered excessively grew very slowly and had various complications. The radishes looked yellow with too much water which we concluded that they were drowning and probably had rotted roots. Overall our study results reveal plants with excessive amounts of water do not grow well.



How are they related to what others found in the “Other’s Work” section?

Based on our result we could not relate it to the ones we found in the “Other’s Work”. Our result for the radishes that were receiving little to no water did not come out as we planned. The artificial light that we were using the soil was not able to dry as it would with sunlight. Our radishes did not experience dry soil, so they were able to grow as the ones watered everyday with the correct amount of water.

Conclusions

In conclusion, the third set didn't fully grow like set one and two did. The radish seed did not grow as much as the other because it had too much water. Set one and two grew normally and their roots were healthy.

Summary

In this project we studied how soil moisture affects plants. We decided to study how soil moisture affects plant growth because the climate is changing and plants that know have to get accustomed to new weather. Some places are getting more rain then they ever had and some are in droughts. We are trying to understand if the plants that are receiving lots of water are growing more than the ones with little to no water.

We conducted this research by using 3 sets of 6 radishes and each set received different amounts of water. One set would receive a little bit of water, the second set would get the normal amount needed, and the third set would receive twice as much water needed. We found that the plants that were receiving little to no water grow almost as big as the set that was getting the required amount of water. The third set had plants growing but they had weak stems and couldn't stay upright. We also noticed that the plants didn't grow as big as the other sets. The results we



got can help the agriculture industry understand the amount of water that plants will need to grow.

Acknowledgements

Each member had to put water on the plants every day, that is, 5 days a week. Each helped the other in taking out the continents outside to water them. We received all of our materials from our Ag teacher, Mr. Miranda. We would like to thank him for the advice he gave us on how to start our project. We would also like to thank our mentor, Tracey Simmons, for helping us understand how the amounts of water being added to our radishes were affecting them. She helped us understand the process of germination and the overall growth of our plants.

