

The salinity of water in the Kingdom of Saudi Arabia and its effect on plant growth, acidity of water, and conductivity

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Methods

Globe devices:

- Hydrometer: to measure specific gravity.
- Alcoholic scale: to measure the temperature of the water.
- Conductivity device: to measure electrical conductivity.
- Salinity tables to measure the salinity of water.
- Water acidity (PH) meter.
- pens and papers A computer for entering readings and analyzing the data.
- Glass tube inserted.

Conclusion

The results show the increase in salinity in the Kingdom's water, which is inversely proportional to the acidity of the water, noting that the water reaches a saturation state due to the constant acidity value. An increase in the salinity of the water also stabilizes the conductivity of the water.-

That the relationship between salty water added to the soil and the degree of plant germination is an inverse relationship, that is, the higher the salinity percentage in the water, the lower the plant growth rate.

The salts in the soil can absorb water, which in turn may reduce the amount of water available for uptake by plants, increase water stress and dry out the roots. This is referred to as physiological drought, which, if not corrected, can lead to reduced plant growth (Mandy and Geoffrey, 2015).-

Salt stress leads the plant to cellular dehydration, which causes a rise in plant osmosis, and soil salinity or irrigation water impedes the absorption of some elements by plants and that the relationship between the salinity of the water added to the plant and the rate of accumulation of harmful ions is a positive relationship so that harmful ions (such as boron ions) are formed. In the soil, as a result of adding salt water, these ions accumulate in the stems and leaves, causing a phenomenon known as burning or leaf burning, where the leaf tips erode and turn brown and lose their vitality (Zaki, 2017).

We all aware that not all plants are affected by high salinity but the majority, but there are plants that are tolerant to salt and need them to grow but are not present in abundance in our environment.

Experiment

In this study, we irrigated the mint plant with tap water and gradually increased its quantity with salt water, which was brought from the Al-Quwaiyah region over a period of three months, and conducted measurements daily at the same time, and recorded the results through the following steps:

1- 200 ml of tap water was placed in a glass tube and the following measurements were made:

- The water temperature using an alcohol thermometer. Water specific gravity using hydrometer
- Finding the salinity level in the water we will irrigate the plants in using the Globe Salinity Tables.
- Measuring the acidity of water using a water pH meter.
- Measuring the level of electrical conductivity of water using the conductivity device.

Next, the saline water was added to the irrigation water sample gradually and the plants were irrigated every period to observe the effect of the salinity of the water on the plant growth.

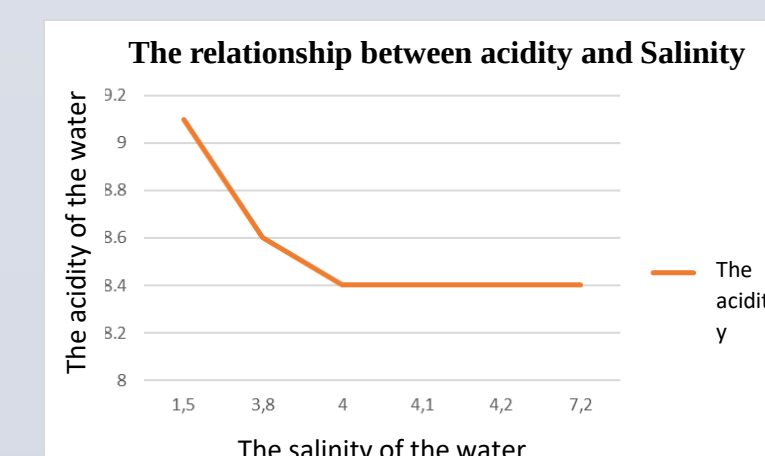
2- In the second time, 60 ml of salt water was added to 200 ml of plain water. Then we haven taken the same measurements as above. High salinity and low acidity were observed.

3- In the third time, 120 ml of saline water was added to 200 ml of plain water and the same measurements were made above. It was observed that the salinity level increased and the acidity of the water decreased while it remained the same throughout the experiment.

4- After re-conducting the experiment many times and increasing the percentage of salt water, we noticed that the acidity of the water reached the saturation level and has not change from the third to the sixth time of the irrigation process. As for the conductivity remained stable from the second time of irrigation until the sixth.

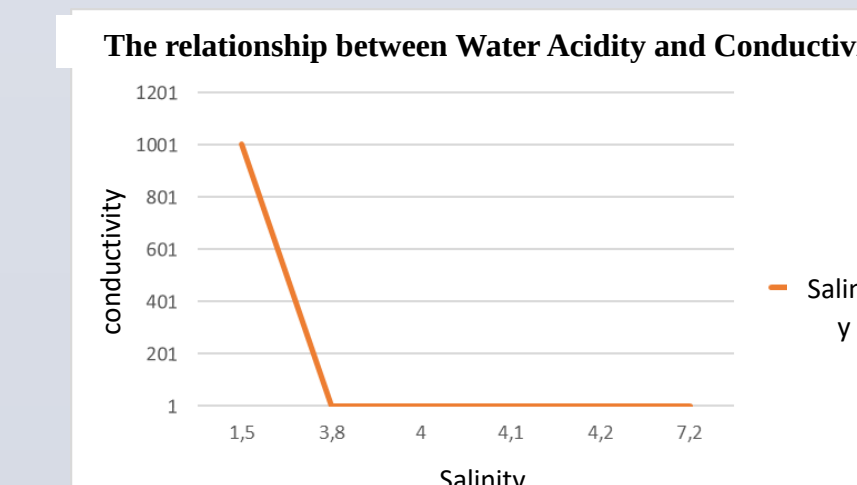
Results

Attempt	Plain water ml	Salty water ml	Temperature elsius)	Typical Intensity	Salinity	Water Acidity
		Without adding salty water				
1	200 ml		22	0.999	1,5	9.1
2	200 ml	60 ml	22	1001	3,8	8.6
3	200 ml	120 ml	22.5	1001	4	8.4
4	200 ml	180 ml	23	1001	4,1	8.4
5	200 ml	210 ml	23.5	1001	4,2	8.4
6	200 ml	240 ml	24	1003	7,2	8.4



The figure shows the quality of an increase in the salinity of the water inversely proportional to the acidity of the water

Attempt	Plain water ml	Salty water ml	Temperature elsius)	Typical Intensity	Salinity	Water Acidity
		Without adding salty water				
1	150 ml		22	0.999	1,5	1001
2	150 ml	60 ml	22	1001	3,8	1
3	150 ml	120 ml	22.5	1001	4	1
4	150 ml	180 ml	23	1001	4,1	1
5	150 ml	210 ml	23.5	1001	4,2	1
6	150 ml	240 ml	24	1003	7,2	1



Increasing the salinity of the water stabilizes the conductivity of the water.

Recommendation

We recommend conducting studies and research on the use of pottery in irrigation of plants and the extent of its effect on diluting water salinity and absorption of sodium ions.

References

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The Problem

The study seeks to find out the effect of the salinity of Saudi Arabia water on conductivity and acidity, and thus its effect on plant growth and productivity level. Consequently, it can adjust the appropriate water properties for plant growth and obtain the best production. It has been acknowledged that water has an important effect on plants from a physiological point of view, being a major factor for the success of plant growth, including the success of the photosynthesis process and many other vital processes such as growth, respiration, etc., so in order to enhance plant growth and improve productive behavior (Geraldo and Henrique, 2014)). It is necessary to understand the behavior of plant growth and the effect of the salinity of Saudi Arabia water on it.

Questions

The main study question is determined by the following question:

What is the influence of the salinity of water in the Kingdom of Saudi Arabia on plant growth?

Which is divided into the following questions:

1- Does the level of salinity in the water of the Kingdom of Saudi Arabia affect the germination of plants?

2- Does the level of salinity in the water of the Kingdom of Saudi Arabia affect the acidity of the water?

3- Does the level of salinity in the water of the Kingdom of Saudi Arabia affect the water conductivity?

Hypotheses

- The level of salinity in the water of the Kingdom of Saudi Arabia affects the germination of plants.
- The level of salinity in the water of the Kingdom of Saudi Arabia affects the acidity of the water.
- The salinity level in the waters of the Kingdom of Saudi Arabia affects the water conductivity.