Abstract

We have done four experiments were conducted on four selected sites to study the effect of water conductivity (seawater water, groundwater wells) on ph values of soil, where water conductivity was measured for the four sites and pH values of the irrigated soils.
Our question was why did the leaves and fruits of irrigated plants fall with desalinated water compared to the leaves and fruits of plants irrigated with groundwater water?

We assumed that:

* Groundwater and desalination water affect the soil and the growth of plants and fruits.
* Ph values in the soil affect the growth of plants and the fall of leaves and fruits.
* Conductivity values affect ph values in soil.

The results obtained can be summed up as follows:

1. Sea water desalination increased the pH values of irrigated soils as they tended to alkalinity compared to ph values of soil irrigated with groundwater that maintained reasonable levels.
2. water desalination sea was one of the reasons leading to the fall of plant leaves and cracking and weak production of fruit compared to groundwater wells that led to the quality of crops and production of fruits well.
3. Electrical conductivity plays an important role in the increase or decrease of ph values of soil where the conductivity

At the end of the study we recommend the following:

Reduce the use of seawater desalination water and replace it with groundwater wells for irrigation of plants.

A Comparative Study of the Effect of Watering with Desalination Water and Groundwater Water on the Change of Ph Soil Values and Plant Growth

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Table of Content

Index tables and graph

Questions and research hypotheses

The problem:

Why are the leaves and fruits of irrigated plants falling with desalinated water compared to the leaves and fruits of plants irrigated with groundwater water?

Questions and hypotheses Research:

Assume that groundwater affects the soil and the growth of plants and fruits.

* What is the impact of groundwater on the growth of plants and the fall of their leaves and fruits?

Assume that desalinated water affects soil and plant and fruit growth.

* What is the effect of desalination water on the growth of plants and their leaves and fruits?

Assume that ph values in soil affect plant growth, leaves and fruits.

* Do ph values affect the growth of plants and their leaves and fruits?

Assume that conductivity values affect ph values in soil.

Does water conductivity affect ph values in soil?

Materials and method

We used the following protocols to study the submitted research:

- Electrical conductivity protocol

- Ph protocol

- GPS

GPS

Steps to determine the coordinates:

- The Gregorian date and the name of the study site are recorded and the source of the data is specified in the data form.
- The device starts at the study site, ensuring that it is held vertically and that there is no barrier between the antenna of the device and the sky.
- The device starts looking for satellites.
- The device is waiting until the device indicates at least four satellites.
- By seeing "D-3" on the screen.
- Within a period of one minute and without moving the device for more than one meter, three readings are taken and recorded in the relevant table in the data form (each reading should include: latitude, latitude, altitude).
- Calculates the rate of measurements for latitude, longitude, and altitude and is recorded in the data form.

Ph protocol

Steps to work using the meter pH :

- pour 30 ml of water sample into a clean and dry cup enough to immerse the electrode of the scale.
- Remove the gauge cap and rinse the electrode and the surrounding area with distilled water using a pressure flask, and then dry with a soft cleaning cloth.
- Press the power switch and then immerse the electrode of the scale in the soil sample irrigated with desalinated water.
- Move the water in the cup once, then record the meter reading after it settles.
- Repeat on the remaining two cups.
- Calculates the rate of the three readings.
- The pH of the water is recorded in the data form.
- Remove the meter from the water and press the power switch to turn it off, rinse the electrode and the surrounding area with distilled water twice using a pressure flask, and then dry with a clean cleaning paper and re-cover it.
- The previous steps are then returned with the soil irrigated with well water.

Electrical conductivity protocol

Measurements of electrical conductivity of water:

- Wear rubber gloves.
- Water temperature is measured at the water search site, if the temperature is between 20 - 30 ° the water temperature is recorded in the data form.
- If the water temperature is less than 20 ° C or higher than 30 ° C, the plastic bottle (633-633 ml) is packed with the water to be measured, the bottle is covered and the sample is transferred to the school's Globe Room and water is left until it reaches 20-30 ° C Data form Wash the cups twice with the sample water.
- Pour about 50 ml of water to be measured in each cup.
- Remove the gauge cover and press the ON / OFF button.
- Wash the electrode at the bottom of the meter with distilled water and then gently dry the electrode with napkins, keeping in mind that it is not scratched. - Place the pole in the first cup and gently stir for several seconds, keeping the meter flat in the bottom of the container or touching the sides of the cup.
- Remove the meter from the first cup and stir gently to remove the water from it and then put in the second cup without washing it with distilled water.
- Leave the pole immersed in water for at least a minute and when the reading is constant, the value is recorded in the data form in the first sample box.
- Repeats the measurement from two other observers using new quantities of water sample each time and records are recorded in the data form in the second and third sample.
- Press the stop button, wash the pole with distilled water, dry and put the lid on it, wash the cups and the sample bottle.

Summary of data
(Study Sites)

Site number	Sites
1	N20°08.801 E041°17.667 2089m
2	N20°08.773 E041°17.744 2116m
3	N20°09.107 E041°17.398 2096m
4	N20°08.921 E041°17.555 2086m

Table 1

Summary of data

(The relationship between the conductivity values of well water and the conductivity values of desalinated water)

Site number	Conductivity values for well water	Site number	Conductivity values of desalinated water
1	µS/cm 1501	3	µS/cm 347
2	µS/cm 1244	4	µS/cm 336

Table 2

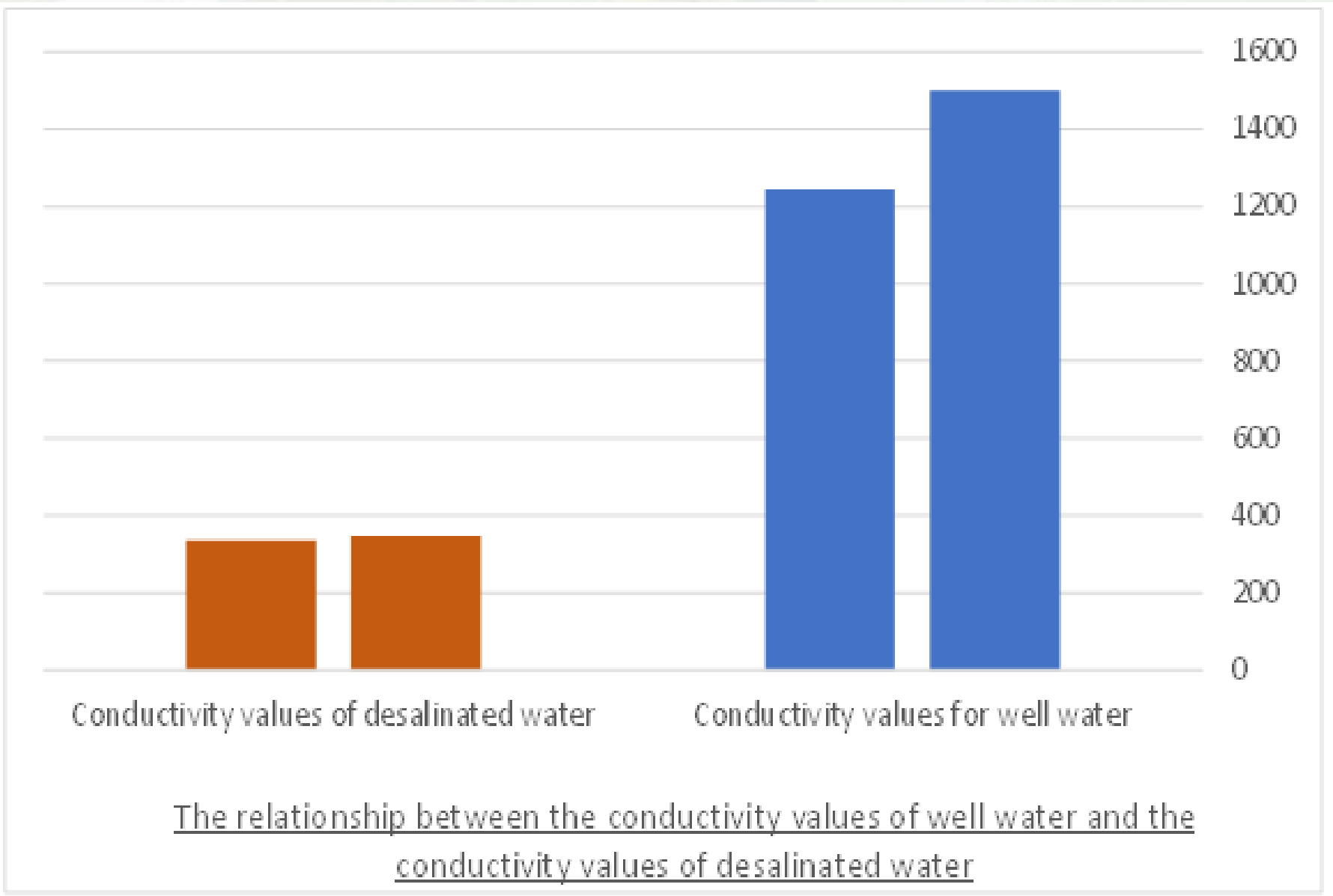
1600
1400
1200
1000
800
600
400
200
0
Conductivity values of desalinated water
Conductivity values for well water
The relationship between the conductivity values of well water and the conductivity values of desalinated water

Chart 1

Summary of data

(Relationship between pH values of well irrigated soils and ph values of soil irrigated with desalinated water)

Site number	PH values of well irrigated soils	Site number	Ph values of soil irrigated with desalinated water
1	8	3	8.8
2	8.3	4	8.9

Table 3

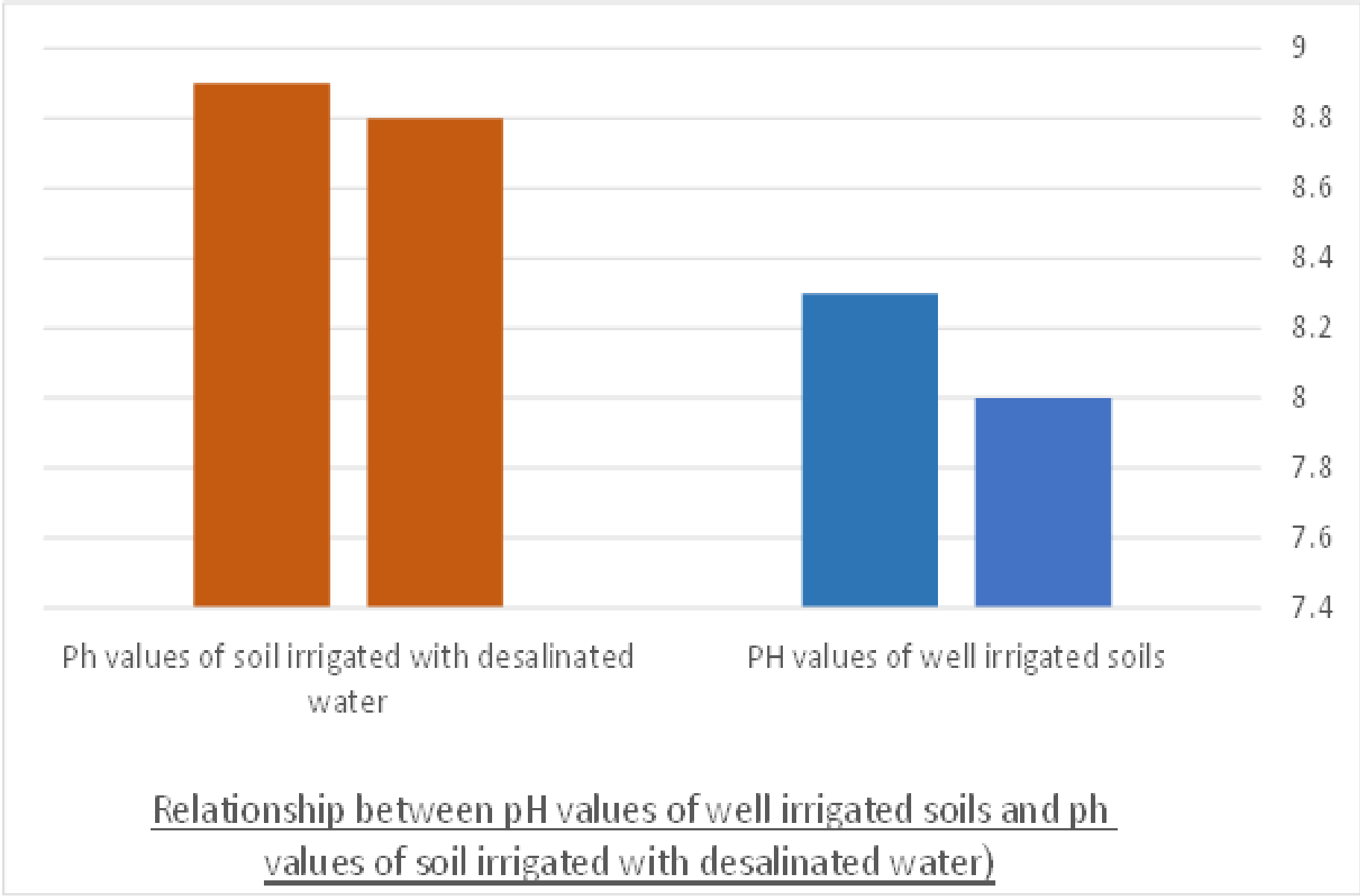
9
8.8
8.6
8.4
8.2
8
7.8
7.6
7.4
Ph values of soil irrigated with desalinated water
PH values of well irrigated soils
Relationship between pH values of well irrigated soils and ph values of soil irrigated with desalinated water)

Chart 2

Summary of data

(A table showing ph values, electrical conductivity, leaf fall and fruit production in mulberry plant)

Site number	Plant type	Ph values for soil	Conductivity values	The extent of leaves falling and the production of fruits	Pictures of leaves and fruits
1	Mulberry plant	8	1501 µS/cm	Tree leaves are good in color and shape The fruits grow and continue until maturity	
2	Mulberry plant	8.3	1244 µS/cm	Tree leaves are good in color and shape The fruits grow and continue until maturity	
3	Mulberry plant	8.8	347 µS/cm	Tree leaves are black The fruits grow first and fall down	
4	Mulberry plant	8.9	336 µS/cm	Tree leaves are black The fruits grow first and fall down	

Table 4

Summary of data

The relationship between pH values and conductivity

Site number	Ph values for soil	Conductivity values
1	8	µS/cm 1501
2	8.3	µS/cm 1244
3	8.8	µS/cm 347
4	8.9	µS/cm 336

Table 5

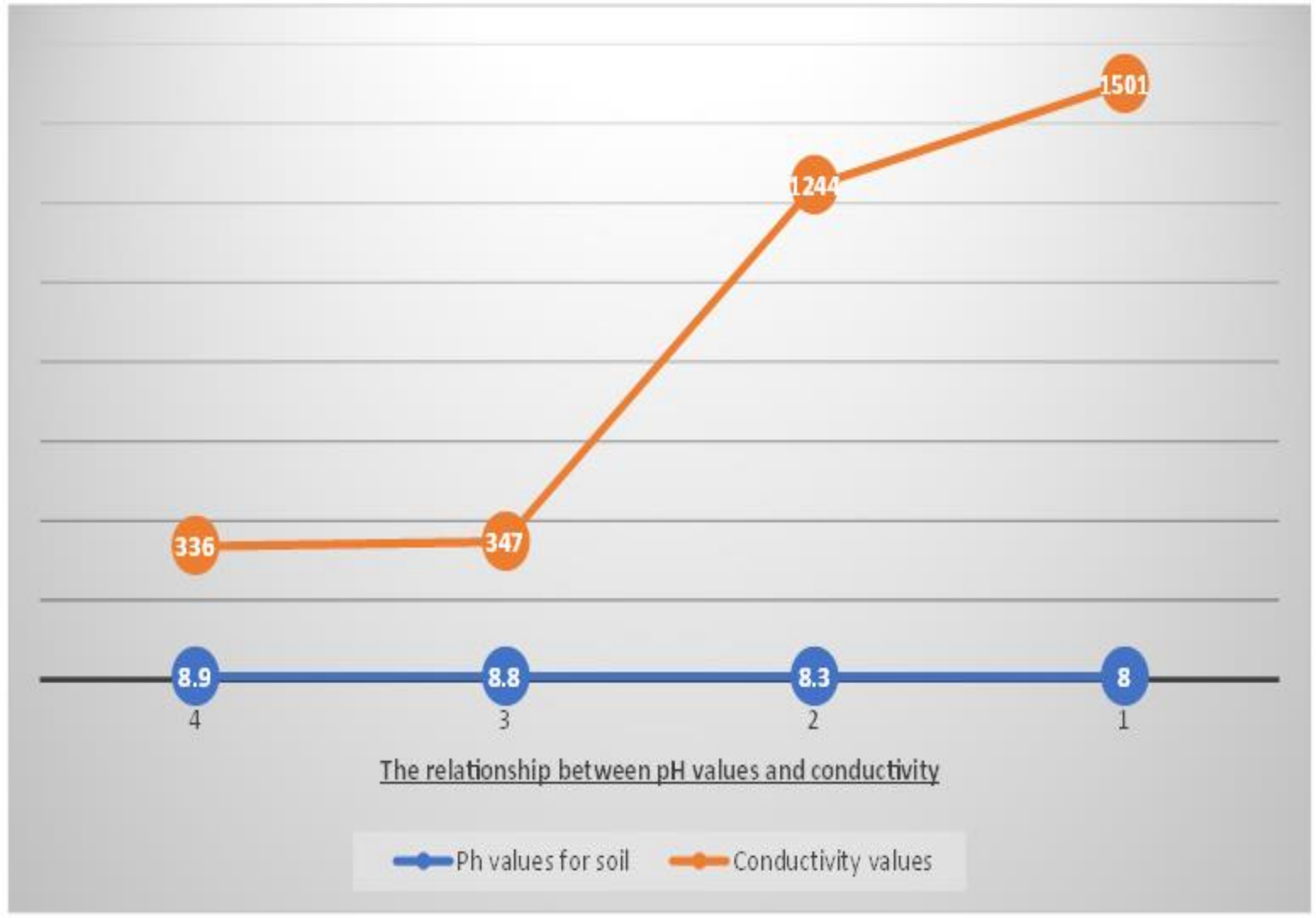
1501
1244
336
347
8.9
8.8
8.3
8
4
3
2
1
The relationship between pH values and conductivity
Ph values for soil
Conductivity values

Chart 3

data analysis :

In Table (1)

soil pH measurements and electrical conductivity measurements for water were taken from 4 different sites.

Site 1, 2 Groundwater Water

3, 4 Desalination Water

Table (2) and Figure (1):

(1) 1501 µS / cm and location (2) 1244 µS / cm and the electrical conductivity values of desalinated water at site (3) 347µS / cm and location (4) 336 µS / cm

through

Table (3) and Graph (2):

The pH values of well irrigated soils were noted with ph at location (8) and location (2) 8.3 and the high pH values of the irrigated soils, where they were on site (3) 8.8 and location (4) 8.9

in Table (4):

It was observed that the plants irrigated with well water with leaves of good color, shape and fruits grow and continue until maturity through the observations of those owners Plantations and plants irrigated with desalinated water with colored leaves and their fruits grow first and are expected to fall

in Table (5) and Graph (3):

Note that the pH values decrease as the electrical conductivity increases and vice versa.

Conclusions

1. Water desalination with seawater affects the pH values of the soil significantly and significantly.

2. Well water irrigation affects soil ph values very little.

3. Desalinated water increased the ph values of irrigated soils as they tended to alkaline compared to ph values of soil irrigated with groundwater that maintained reasonable levels.

4. Water Desalination was one of the reasons leading to the fall of leaf plants and cracking and weak production of fruits compared to groundwater wells that led to the quality of crops and the production of fruits well.

5. Electrical conductivity plays an important role in increasing or decreasing ph values of soil.

Discussion

- Electrical conductivity plays an important role in the increase or decrease of ph values in the soil affecting the quality of the crop.
- According to previous studies:

1. When the earth is alkaline, the iron hydroxide salts which are not absorbed by the plant are called iron deficiency, and if the pH values in the soil change significantly, this may adversely affect the functions of the members of the plant and the water of desalination may have an impact

2 - of the components needed by the plant Nitrogen and get it from nitrates if the earth alkaline and may be membranes of plant berries is not permeable nitrates, that is, it needs acidic land for its growth and therefore fell leaves and fruits when the increased alkalinity of soil as a result of watering soil water compared to leaves and fruits of bitter mulberry plant Uh wells ..

Recommendations

- The decrease in the use of seawater desalination water and its replacement with groundwater water for irrigation of plants. There were significant changes in pH ratios in irrigated soils and their transformation into highly alkaline soils as well as the leaves and fruits of irrigated plants compared to plants irrigated with groundwater wells.

- Desalination water may contain heavy metal elements resulting from chemical treatment, which is one of the reasons for changing soil acidity, which may take many years to reach the high levels of change observed during the experiments.

Acknowledgments

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Researchers

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