

# Effect of Magnetization of Fresh and Salt Water for Irrigation in Some of the Physical Characteristics of the Soil and the Growth of Wheat

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**ABSTRACT:** This study aims to determine the effect of two types of water (freshwater and saltwater) and the extent of their effect when the magnetized them in some of the qualities of the soil and plants. The quality of distinctive soils in terms of texture, they are brought from different locations. Then the researcher grind, sifted after that filled them in potted plastic (ten kilometers per pot). Planting a plant wheat Cham Class 6 was treated in two different two types of water and when magnetized them, they will be four types of water. The results of the study show that sandy clay soil was irrigated better by freshwater than the salty. And it had a positive effect after magnetizing the water. This is clear on the characteristics of the soil and plant since the results show that the soils irrigated with magnetized fresh water, and salt water improved physical properties as decreased bulk density of 1.28 to 1.26 and from 1.31 to 1.30 so increased porosity and increased water conductivity of soils and decreased soil resistance to penetration 161.5 to 145.5 and 172.5 to 152 for the salt water as the weighted average of the soil increased diameter. I furthermore, found that the magnetization of water has a positive impact on the plant a good crop, with increased plant height and dry matter for the plant and the weight of the grain at a excellent rate. It is shown from the above that the magnetized water irrigation has a good effect in all the qualities of the physical characteristics of the soil and the plant, thereby increasing the product.

**KEYWORDS:** Magnetized water, Wheat plant , Physical characteristics of the soil, fresh and salt water

## I. INTRODUCTION

Irrigation water validity is based on specific properties, dissolving salts in irrigation water determine to a big extent the validity of that water. This influence of salts is mainly due to the effort osmotic and its impact on crop growth. Since the water contains high concentrations of salts, these salts determine the plant's absorption of water , affect its growth, and cause change in building the soil and its permeability and this in turn affects plant growth indirectly (Dradkh, 1987). And talking in the field of water magnetization, which will have a role in this study, one must first know what is the magnetic field. It is the amount of directional and can be represented by imaginary lines called magnetic flux lines (Lines of Induction) and the number of magnetic vertical lines in the unit area called the intensity of the magnetic flux or intensity flux magnetic (magnetic Induction Intensity). Scientific explanation can clarify what a molecule of water is happening; that is the water polar liquid, and every part of the water molecule have a positive electric charge and the other part has a negative electrical charge, but the outcome of the electric charge is negative. In other words, the dual-water pole and the magnetic field are changed by rotating the molecule in one direction or another; to take the high negative voltage or positive depends on the external magnetic field on the user Antarctica positive or negative northern (Hassan et al., 2005).

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The statement of magnetization relationship to soil, water and salt, is the basis of the method that the magnetic technique changes the physical and chemical properties of ordinary water, which leads to improve dissolving capacity. That is why the separation of salts from the soil gets much better, and nutrients and fertilizers absorb as best during the growth period. Mahjob and Taher (2005) point out that there is more than 14 property change on the water after it passes through the magnetic field, including the electric conductivity properties, increases the proportion of dissolved oxygen into the water, increases the ability to dissolve the salts and acids, surface tension, the change in the speed of chemical reactions, properties of evaporation and hydration and viscosity measurement electrical insulation, increases the permeability and optical properties, and others. He points out (Corbelt et al., 2002) the use of magnetic technology in the field of sprinkler irrigation and drip systems reduces plaque buildup and increases the efficiency to the system by reducing user effort to pump water. Habas (2005) explained the possibility of saline water use in agriculture, as well as helping to wash the soil of salts significantly, and this process is expensive in economic terms because they mainly depends on passing water through a magnetized metal tube stretch. This device's power is for more than ten years. (Herodiza, 1999) Showed in light of a series of experiments that the water magnetized irrigation has led to an increase in the height of the popcorn plant, number of and the length leaves, and stem diameter, which has got an overall increase of 40% of the total vegetative plant maize compared irrigated regular non-magnetized. (Hilal and Hilal (b), 2000) studies the irrigation is effected by the regular and salt water and its magnetization. He notes that the magnetization of the two kinds of water has led to an increase in germination rates and improvement of saline soil conditions also led to an increase in the emergence of seedling to three times as a result of the impact of magnetized water to improve soil physical properties and reduce the surface crust and led to lifting the soil retain water ratios. Al adjadjiyah(2002) Has pointed out that the magnetization of yellow corn seeds led to an increase in the percentage of germination and an increase in the weight of the vegetation and height by 72 and 25%, respectively. Habas (2005) has explained that the magnetic energy application in agriculture through the magnetization of irrigation water, as well as seeds lead to savings in the amount of seeds by about 40% as well as shortcut growth to the plant stage at about 15-20 days and reduce plant disease by about 60% as well as to provide about 30% of water used in irrigation as well as savings in the compost. Irrigation magnetized water has also led to an early product of lettuce in LosCatos northern California about 30 days (Smith, 2005). In the tests (2004), Magnetizer Research Institute conducted at the state (Pennsylvania) in the United States, resulted in the use of magnetized water for irrigation (Magnetizer) to increase in maize and product growth.

## II .RELATED WORK

The implementation of this experiment in the wooden canopy and the soil is selected from two different locations in the city Midhteah in Babylon province on the basis of their differences in terms of Texture as the first soil is sandy loam and the second is clayey . These two kinds od soil are taken from the sites and were grinding and sifting and distributed to plastic pots 10 kg Capacity Table (1) shows the characteristics of soils under study and planting a plant wheat class Cham 6 *Triticumaestivum* L. these pots have been treated by two types of water which have been magnetized.irrigation water has been magnetized through the pass the watering water through degaussing device to become (fresh water river and fresh water river magnetized and water well salty and well water salty magnetized) ,thewatering level was equal duration of Agriculture and table (2) shows the water qualities used in the study. the study and watering regularly lasted until be cereal, getting the number of transactions (4 levels of water \* 2 types of soil \* 3 replications = 36 treated). then soil was moved to the laboratory to conduct some physical measurements, a virtual and real density, porosity and conductivity of water and the rate of diameter weighted resistance of soil to penetration as well as the measurement of each of the plant height and holds dry matter weight of 100 tablets. this study aims to demonstrate the effect of salinity of the water and Magnetize on soil and plants.

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Table (1) some of the physical and chemical characteristics of the soil under study

characters	Unit	Sandy Loam soil (Loc.1)	Clayey soil (Loc.2)
Bulk Density	gm.cm <sup>-3</sup>	1.33	1.38
porosity	%	49.8	47.9
Water conductivity	cm.h <sup>-3</sup>	0.74	6.40
sand	gm.kgm <sup>-1</sup>	665	215
silt	gm.kgm <sup>-1</sup>	146	380
sand	gm.kgm <sup>-1</sup>	189	405
Texture		Sandy Loam	clayey
PH		7.20	7.73
Ece	Mlimos.cm <sup>-1</sup>	4.2	1.5
O.M	gm.kgm <sup>-1</sup>	5.10	15.5
Caco <sub>3</sub>	gm.kgm <sup>-1</sup>	150	305
Ca <sup>+2</sup>	Mol.L <sup>-1</sup>	12	3.4
Na <sup>+</sup>	Mol.L <sup>-1</sup>	10	3.7
So <sub>4</sub> <sup>-2</sup>	Mol.L <sup>-1</sup>	10	5.6
Cl <sup>-</sup>	Mol.L <sup>-1</sup>	28	4.8

Table (2) some of the qualities of the water used in the study

characters	Unit	Fresh Water		Salt Water	
		Before magnetization	After magnetization	Before magnetization	After magnetization
Ece	Mlimos.cm <sup>-1</sup>	0.88	0.72	4.45	4.20
PH		7.21	7.57	7.73	7.75
SAR	Mmol.L <sup>-1</sup>	1.20	1.10	6.10	6.20
Ca <sup>+2</sup>	Mmol.L <sup>-1</sup>	2.91	2.85	3.84	3.82
Na <sup>+</sup>	Mmol.L <sup>-1</sup>	2.15	2.01	22.50	20.50
So <sub>4</sub> <sup>-2</sup>	Mmol.L <sup>-1</sup>	3.15	2.62	8.74	8.57
Cl <sup>-</sup>	Mmol.L <sup>-1</sup>	2.32	2.10	23.33	22.51
Mg <sup>+2</sup>	Mmol.L <sup>-1</sup>	2.65	2.10	7.53	7.36

### III. EXPERIMENTAL RESULTS

**- The effect of magnetization of fresh and salt water for irrigation in bulk density and total porosity of the soil:**

The results ,Showed in Table 3 and Figure (1) ,indicated the impact of magnetization salt water and fresh water to bulk density, as the value of bulk density of soils irrigated with fresh water to 1.28 g / cm<sup>-3</sup>, while the well water was a bulk density 1.31 g / cm<sup>-3</sup>

Table (3) values of bulk density of soils irrigated with water irrigation of fresh and salt before and after magnetize (g . cm<sup>-3</sup>)

	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	1.31	1.28	1.34	1.33	1.31
Clay soil	1.26	1.24	1.28	1.27	1.26
Average magnetized water type	1.28	1.26	1.31	1.30	

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This is due to the demolition and dispersing the soft foils of soil, especially clay and silt, which led to the closure and clogged soil porosity and stressed that both (Aloutifi, 2013). While the value of bulk density of soils above fresh water magnetized 1.26 g .cm<sup>-3</sup> and amounted to 1.295 .c m<sup>-3</sup> to magnetized salt water so magnetized water works to reduce bulk density values and that is due to what the magnetization of water does to dissolve and wash the salt, which works to prevent the accumulation in soil and lead for building good soil (Fluid 2000).

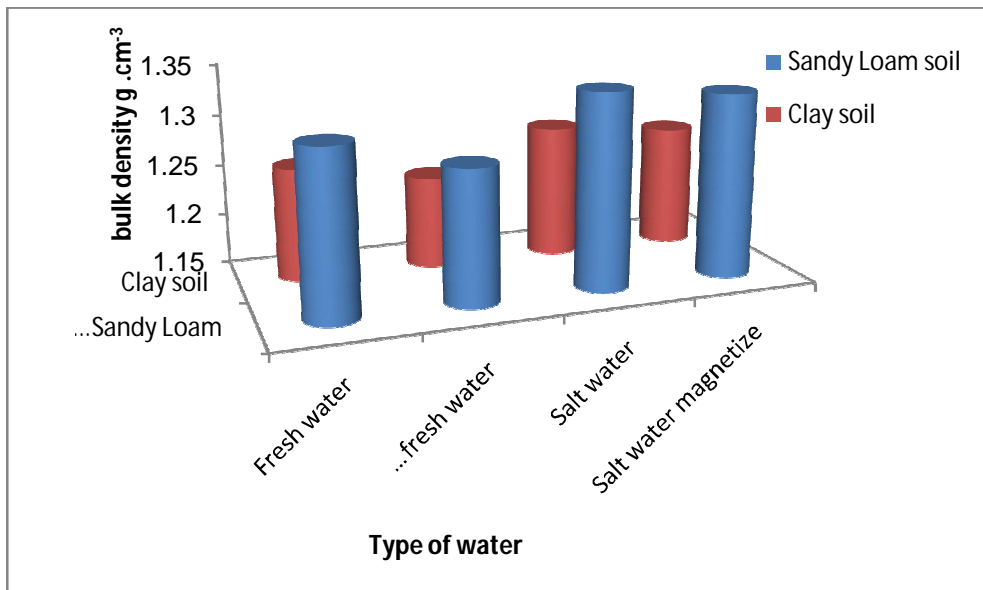


Figure (1) Bulk density of soils irrigated with water irrigation of fresh and salt before and after magnetize (g . cm<sup>-3</sup>)

As for the porosity of the soil, it has reached 49% for fresh water, but when watering with salt water, it has reached 47.9%. The decrease in porosity is due to high bulk density and dispersion of soil's foils and gathering foils and the blockage of large foils after filled out small few ones, leading to reduce the total porosity. This meets the findings of the Boldyerr 1978 and Abdulmunem et al (2011). As for the impact of magnetized irrigation water, it has been found that the magnetization of water is working to raise the porosity values. It was 49% of fresh water and 47.9% for the salty water, and after the magnetization, we got 49.55% and 48.5% respectively.

Table (4) porosity for soils irrigated with water irrigation of fresh and salt before and after Magnetize (%)

	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	48.2	49	46.8	47.4	47.85
Clay soil	49.8	50.1	49	49.6	49.62
Average magnetized water type	49	49.55	47.9	48.5	

This is attributed to the fact that when using magnetized, it water will pass through a magnetic field which changes the salty compositions of irrigation water. Making it a less distracting capacity and limit the negative impact of salty irrigation water. This meets the findings by Abdulmunem, (2008)



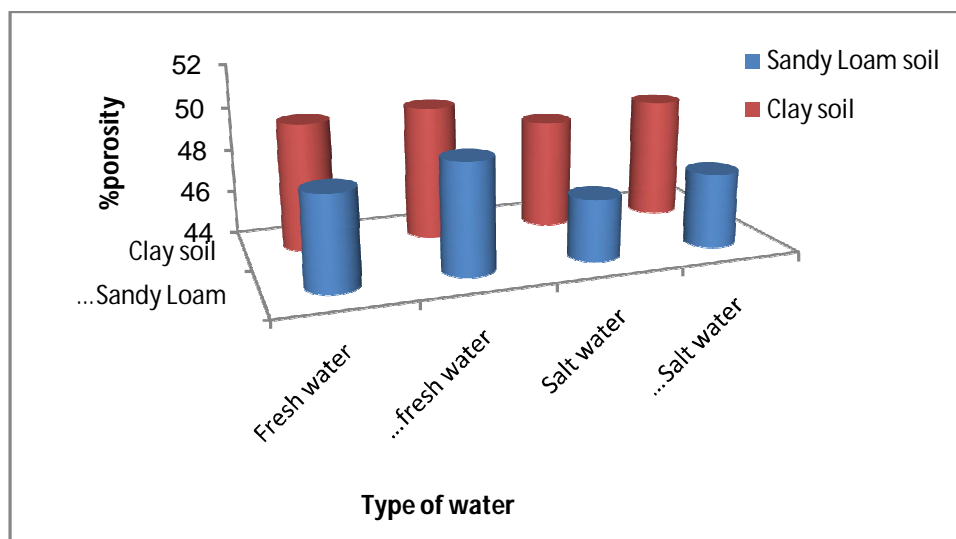


Figure (2) porous soil irrigated with water irrigation of fresh and salt before and after magnetize (%)

**-The effect of magnetization of fresh and salt water in the irrigation water conductivity of the soil:** Table (5) and figure (3) to show the impact of water quality and its magnazation on water conductivity of the two kinds of soils. It has found that when watering with fresh water the conductivity of water higher than when watering with salty water. This conductivity is 6.34 and 0.73 cm. H -1, for the two kinds of soil, respectively. When irrigation with salt water, the conductivity of the water is 5.90 and 0.693 cm. H -1 for the same kinds of soil above, respectively. Thus, the results show that the greater salt of the irrigation water is, the less water conductivity gets. This is attributed the cause to an increase in as the concentration of salts in the soil, which leads to deflect and disperses the soil aggregates and starting soft foils (clay and silt) and deposition within the pores' interfaces and seclusion and blockage (Herodiza, G. 1999 , Aloutifi 2013 and Pearson 2004).

Table (5) Water conductivity qualities magnetized and non-magnetized water (cm.h<sup>-1</sup>)

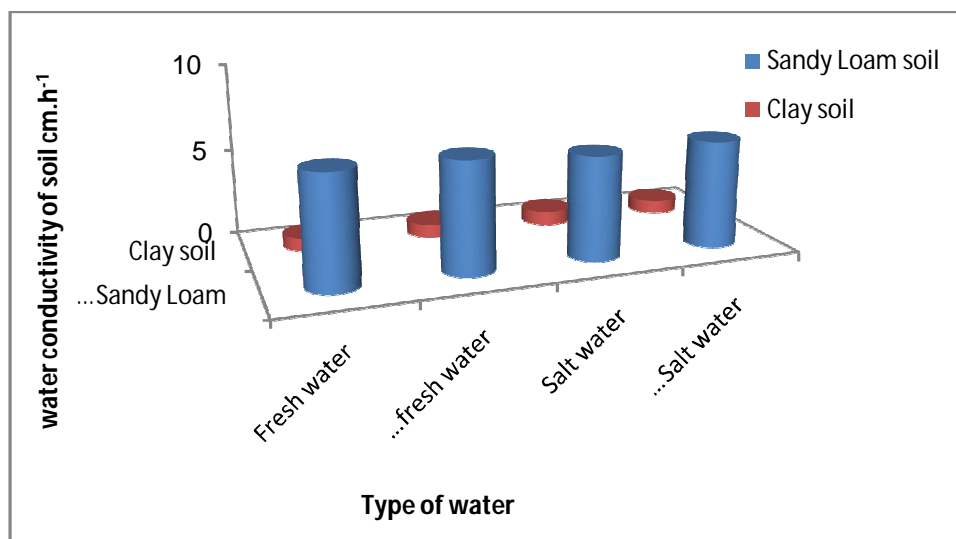
	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	6.345	6.330	5.909	6.110	6.173
Clay soil	0.730	0.749	0.793	0.775	0.761
Average magnetized water type	3.537	3.539	3.351	3.442	

Magnetization of water also led to the lifting of water conductivity rate for the two kinds of soil above, and for the two kinds of water used. In general, the conductivity was 3.53 cm. -1Hour of fresh water and becomes 3.55 cm. -1 hour after magnetized. And it was 3.30 cm1 hour to salt water and hit to3.44 cm. H -1after magnetized. The reason for that is due to the salt water, the effect of increasing permeability, the less salt than is reflected in the positive conductivity increase (Abdulmunem, 2008)

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Figure( 3) Water conductivity qualities magnetized and non-magnetized water

**-The effect of magnetization of fresh and salt water for irrigation in the soil resistance to penetration -** Table (6) and figure (4) show soil resistance values to penetration when watering with saltwater and fresh water, and when the magnetization of the water as it amounted to 161.5 kPa of fresh water and increased this value amounted to 172.5 kPa to salt water. The cause of the high resistance to the soil when watering with saltwater is that salts in irrigation water worked on dispersing rallies, and a lower rate weighted diameter and increased bulk density, leading to an increase in soil resistance to penetration (shainberg and singer 1985) and (Abdulmunem, 2008)

Table (6) of soil resistance to penetration of the qualities of magnetic and non-magnetic water values (kPa)

	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	180	172	193	176	180.25
Clay soil	143	119	152	128	135.5
Average magnetized water type	161.5	145.5	172.5	152	

It has been found that the magnetization of water operates upon the devaluation of the soil resistance to penetration, as the value of soil resistance to penetration 145.5 kPa fresh water magnetized after it was 161.5 kPa for fresh water and amounted to 152 kPa to salt water magnetized after it was 172.5 kPa to salt water. That's a good thing to facilitate root penetration of the soil process is because that when the water passes in a magnetic field, it will reduce the negative effect of salts on the water and increase the viability of the water to dissolve salt and reduce the fragmentation of communities and reduce the developments of the density of a virtual increase (kronenberg 2005).

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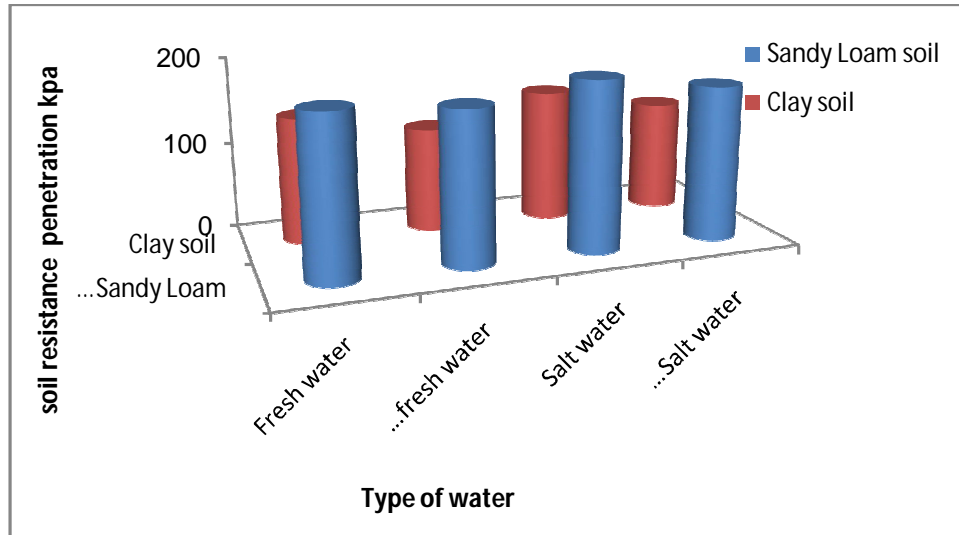


Figure (4) soil resistance to penetration of the qualities of magnetic and non-magnetic water (kPa)

### -Effect of magnetization of freshwater for irrigation and salt in the weighted average diameter:

Table (7) and (Figure 5) show the impact of irrigation used water quality in the average weighted diameter as well as when the magnetization of this water. It has been found that the rate of weighted diameter at irrigation with fresh water is 0.428 mm while when irrigation with salt water the rate of weighted diameter is .538 mm. The reason is that water salty soils containing a high concentration of sodium ions, which are working on the dispersion of clay minutes as well as solve the sodium calcium place on the surfaces of exchanges leading to break the soil concentrations (Hamdani .2001)

Table(7)value effect of magnetization of freshwater for irrigation and salt in the weighted average diameter

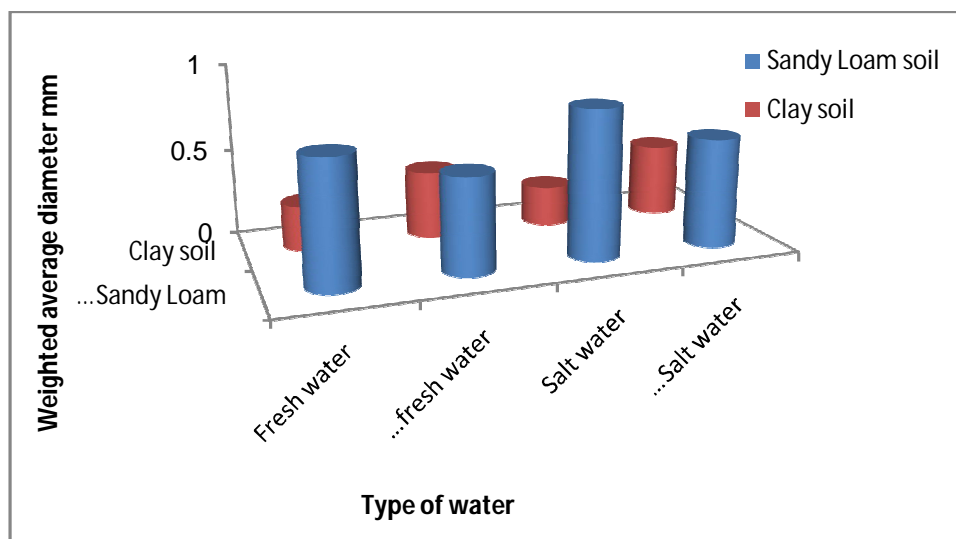
	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	0.709	0.543	0.848	0.623	0.680
Clay soil	0.255	0.385	0.229	0.419	0.322
Average magnetized water type	0.482	0.464	0.538	0.521	

While the part to the effect of magnetization of water in two kinds of soil, the magnetization of water varies depending on soil tissues and water quality as it worked magnetization water soil's sandy loam to reduce the rate of Distance Weighted 0.709 mm to 0.543 mm. When irrigation magnetized water and dropped from 0.848 mm to 0.623 mm to salt water magnetized, to the contrary, mud, rising value when the magnetization of water. After that was 0.255 mm for fresh water has become 0.385 mm, and after it was .229 mm became .419 mm when magnetize. That is due to soil physical properties and chemical induced magnetization, which affects the qualities of soil sandy and clay worked to edit recipe diameter weighted by improving soil building this is consistent with what it says (Schnell 2001 and , Mahjob and Taher ,2005)

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Figure(5) effect of magnetization of freshwater for irrigation and salt in the weighted average diameter

### -Effect of magnetization of freshwater for irrigation and salt in the Plant height

Table (8) and Figure(6) show the effect of fresh water and saltwater and the magnetization of the water in the high plant wheat, as the result without the effect of magnetization is 61.75 cm freshwater and 65 cm saltwater. These results indicate that fresh water was the best. This is due to the influence osmotic salt water and the toxic effect it works to .inhibit the growth of microorganisms (Herodiza 1990 and Aloutifi, 2013)

Table (8) value effect of magnetization of freshwater for irrigation and salt in the Plant height

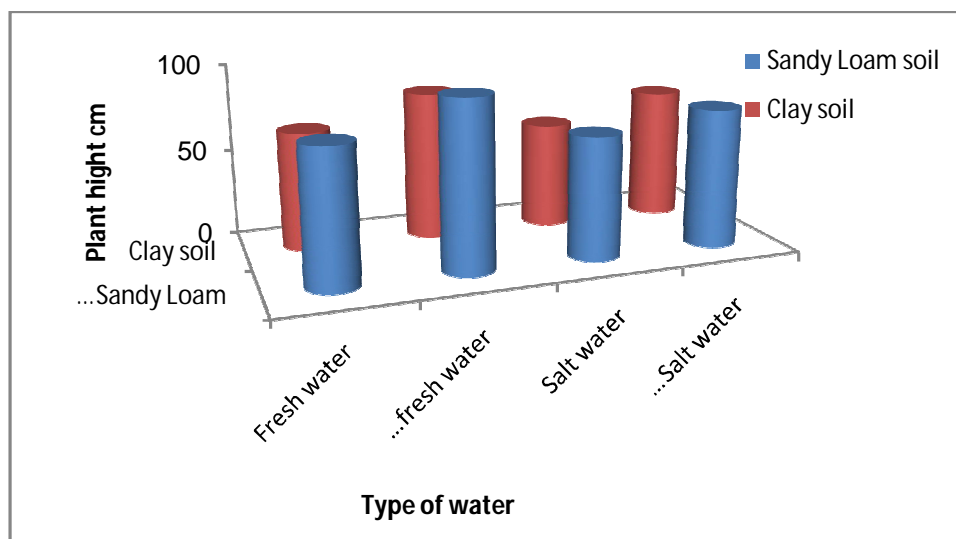
	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	76.6	95.5	69.3	78.9	80.0
Clay soil	67.2	84.4	60.7	75.4	71.9
Average magnetized water type	71.9	90.1	65.0	77.1	

In terms of the effect of magnetization of water, it has been found that the magnetization good effect is the increase in plant height, rising in freshwater 79.95 cm when magnetize as 76.15 cm rows at the magnetization of salt water. It is largely up to reduce the surface tension of water, making it easier for the plant to reduce the effort to pull the water and nutrients (Aboud 1998 AlJawthire 2006 Aladjadjiah 2002).

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Figure(6) effect of magnetization of freshwater for irrigation and salt in the Plant height

### -Effect of magnetization of freshwater for irrigation and salt in the amount of dry vegetative part

Table (9) and Figure(7) Shows the effect of irrigation water quality in the amount of dried vegetative part. As it was at an average of 44.95 gm when irrigated with fresh water, the amount of dried vegetation segments fell to 38.15 gm when irrigated with saltwater irrespective of the quality of soils in terms of texture. That's because to what was done to salt water of the impact on plant and soil growth. In general, it is working to inhibition of photosynthesis and the negative impact on the osmotic pressure and the lack of availability of nutrients and lack of the amount of water absorbed as well as the accumulation of ions such as sodium and chloride to the extent of toxicity (AlJawthire, 2006)

Table(9) value effect of magnetization of freshwater for irrigation and salt in the amount of dry vegetative part

	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	50.8	57.1	45.5	51.1	51.1
Clay soil	39.9	49.5	30.8	36.6	39.2
Average magnetized water type	45.3	53.3	38.1	43.8	

In terms of the effect of magnetization of water in the dried matter has been found that the magnetization of water works to raise the weight of dried matter, and this reflects the excellence to increase product if increased in fresh water when magnetized from 45.35 gm to 53.3 gm while increased from 38.15 gm to 34.85 gm when the magnetization of salt water. This is because of reducing the magnetization of water from the osmotic effect of salt of the plant and thus the plant can get their needs of water and make less effort (Al adjadjyah 2002 Hummadi 2000 and Wasef 2005).

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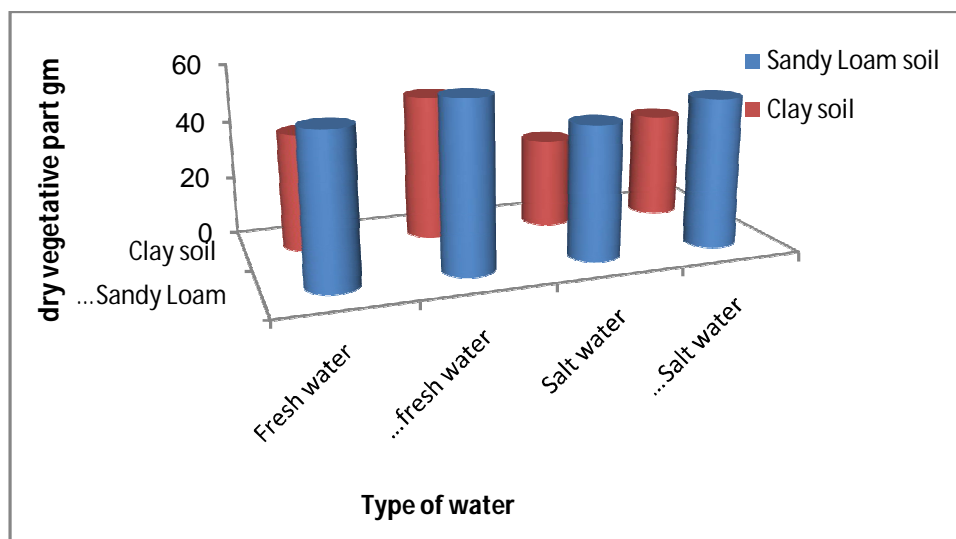


Figure (7) value effect of magnetization of fresh water for irrigation and salt in the amount of dry vegetative part

### -The effect of magnetization of fresh and salt water in the productivity and 100 weightseed

Results shown in Table (10) and figure (8) explain the effect of water quality in grain production 2.16 gm when watering with fresh water and dropped to 1.60 gm when watering with salt water regardless of the type of soil. this is attributed to the fact that saline irrigation water worked to discourage microbiology plant due to high osmotic pressure existence salts in the water (Abdulmunem, 2008)

As for the effect of magnetized water, it has been found to have a positive impact in increasing grain weight because of its impact is effective in improving the water quality. After it was 2.16 gm for fresh water became 2.71 gm after the magnetization. As well as the rate of grain weight increased to salt water from 1.60 to 2.18 after the magnetization

Table (10) of the productivity and 100 weight seed of magnetic and non-magnetic water (kPa)

	Fresh water	fresh water magnetized	Salt water	Salt water magnetize	Average
Sandy Loam soil	2.28	2.87	1.92	2.22	2.32
Clay soil	2.05	2.55	1.82	2.15	2.14
Average magnetized water type	2.16	2.71	1.87	2.18	

This is due to the water-magnetic role in increasing the growth of plants and then increase in the availability of nutrients and encourage the seeds to penetrate the soil and this in turn encourages the plant and increase production growth (Kronenberg,2005 . Smith,2005).



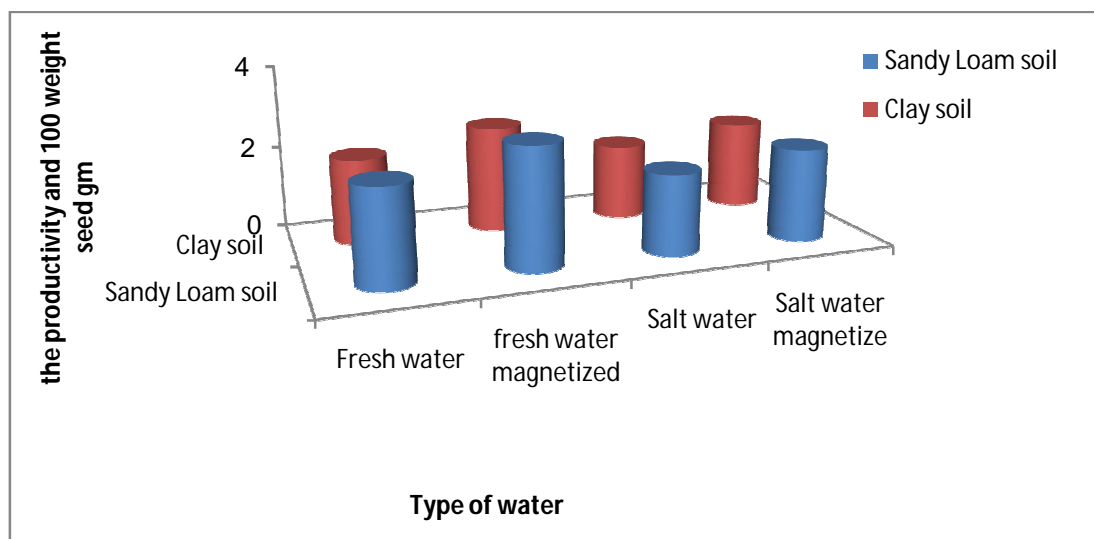


Figure (8) Magnetize the effect of irrigation water saltwater and fresh water in 100 seed weight

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