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The Impact of the Use of Magnetic Technology in the Hydrogen Number (pH) and Salinity (EC) of Irrigation Water and Soil

Применение магнитной технологии для изменения характеристики воды в ирригации

Высокое содержание солей в почве Арабских стран является главной проблемой сельского хозяйства. Орошение земель из природных водоемов водой в виде тумана и мелкодисперсных капель только частично решает проблему. Перспективным является магнитная обработка воды в ирригационных системах. Приведены результаты экспериментов по магнитной обработке воды и почвы из разных районов провинции Ниневии в Ираке. Ионизация в магнитном поле снизила концентрацию солей в воде на ≈50, а в почве на ≈60%.

***Ключевые слова**: вода почва, ирригация, содержание солей, показатель pH, магнитная обработка.*

Високий ,вміст, солей у ґрунті Арабських країн є головною проблемою сільського господарства. Зрошення земель із природних водойм водою у вигляді туману й мілкодисперсних капель тільки частково вирішує проблему. Перспективним є магнітна обробка води в іригаційних системах. Приведені результати експериментів по магнітній обробці води й ґрунту з різних районів провінції Ниневії в Іраку. Іонізація в магнитному полі знизила концентрацію солей у воді на ≈50, а в ґрунті на ≈60%.

***Ключові слова**: вода ґрунт, іригація, вміст, солей, показник pH, магнітна обробка.*

Abstract

The current study addressed the use of technologies in the magnetic field of irrigation and the improvement of some soil characteristics, in order to study the effect of magnetization of irrigation water in the improvement of some properties of soil. Seven samples of water and soil were selected. (Five of which were taken from certain areas of the province of Nineveh and the latest addition of two different concentration of salt), and conducted assessment of the pH of those samples, as well as electrical conductivity or salinity E_C before the subject of magnetism and the results were recorded. Section of each sample from those forms into three parts, and passed first parts of the samples of magnetic field for one hour and the second for two and the third for three hours, then the change was registered in the values of pH and E_C of each part after the end of a period subjected to the magnetic field. The results of the study showed that a significant change has happened to the parts of the seven samples after magnetic field were passing them, and in particular the values of E_C, where the values decreased from 24 to 15 ds.m^{-1} for water and from 14.5 to 8.91 ds.m^{-1}, and given that this technology positive effect on the magnetic properties of the water to become more energetic and vital as well as the soil to increase the readiness of some of the nutrients necessary for plant growth instead of fertilization in certain areas in the Arab world, which reduces environmental pollution.

Introduction

Human nature does not accept the unknown, and may stand a stance of hostility towards it. It has been magnetic in early times have been associated with witchcraft and sorcery with the growth of human knowledge of the techniques of magnetic, magnetic began to impose themselves on our daily lives as a form of energy and varied uses in all fields. As the flag was in the past has been linked to witchcraft, these techniques correspond to the newly shock and disbelief and still retain the developed countries, identified it from the secrets of magnetic secretly do not go for very little.

In the late twentieth century, astronomers have uncovered, and nuclear physics unveiled the secrets of black holes and exploding some of the giant stars after the turn to the whole interior, iron, and activated explosive, and this no doubt what happened when the universe was created and is still repeated to this day. The use of magnets in various fields dating back to times of very long standing, and has been used in the treatment of joint pain and bone healing. Scientists saw magnetic cells that each cell of our bodies is a generator of small particles on the grounds that the activity of creation depends on the entry and exit of ions [1].

In the area of agriculture and irrigation, the problem of salinity of land is the most important of agriculture in the Arab world that most of its territory falls within the arid and semi-arid, and is known that the dry-land and semi-arid land is more valuable because of their possible exploitation for more than one crop per year, as well as the ease of exploitation because they are characterized by ventilation system and the temperature is very suitable for agriculture. Besides, the system of water can be controlled easily, and through irrigation. So the problem of salinity should be at the forefront of the problems that impede agriculture in the Arab land which requires deep study and find ways to address them, as affected by soil salinity adversely affect

crop growth and economic strategy, and the impact of fires on plants show signs of thirst due to the increase of early osmosis pressure making it difficult for plants to absorb water from the soil and some toxic effect of salts in the plant, leading to his death or disability and growth through interference in the physiological processes required, as in Boron element needed by plants and small amounts but in the case of increasing focus for a few parts per million, it becomes toxic to plants [2].

This study aims to describe the impact of the use of techniques of magnetic water, soil and extent of the change that occurs in the pH as well as the amount of change in electrical conductivity or salinity EC to them, and when the use of samples have different values for these properties and promised them samples of comparison (before the subject of magnetization) and by collecting various samples of water and soil from various parts of the Nineveh province and different chemical characteristics, then to subject to technical magnetic (magnetized) to indicate changes that would happen to these two properties of water and soil, which works to reduce the proportion of salinity and thus help the plant to grow in the middle of salt [3].

The tests were applied in some countries in the field of irrigation and implants using magnetic technology heralded important results in the use of magnetic water in irrigation operations of agricultural crops and magnetizing seeds, which helps to promote energy potential. And adopt the recruitment of magnetic techniques in irrigation to take into account several factors, including salinity, soil salinity, water flow speed of the devices used for irrigation and kind, and by the fact that magnetized water helps to break down, fragmenting atoms of salts, it can help significantly to leaching and help plants to absorb water and nutrients in the soil so easily, as well as high salinity, the dissolved oxygen at a rate exceeded that of the great vitality and the ability of plants and crops to resist diseases and access to good agricultural crops in terms of quantity and quality, and more importantly, the magnetization of water help to provide water used for irrigation and reduce the use of chemical fertilizers, which reflects positively on the health of the environment and people [4,5].

The research has conducted some studies and research in Egypt on the employment of sediment magnetism that comes with the Nile water, which revolutionized the field of agriculture, particularly in the employment of this technique in the desert areas [1]. Proved tests conducted at the National Center for Research in Egypt has also been analyzed tissue when plants were irrigated with water magnetic and other normal water from the same source data and the same plants that were irrigated with water the ratio of magnetic absorption of chlorine and sodium which are very small compared to the other. In another experiment conducted in Australia, the proportion of water washing of the soil magnetic equivalent to three times compare to plain water for the same soil and help in washing the boron as a difficult washed from the soil [6]. The experiment was a major operation in a lake and park in the Crimean city of Muscat in the Sultanate of Oman in 1995, and magnetic systems have been installed in the fountain, which mediates the lake, water analysis has shown a significant change in the specifications of the water, raising the lake's water fountain with the continued operation of the magnetism of the water more transparent and small plants and shellfish more active and vibrant and vast numbers of fish born in the water and environmental shifts have taken place with the value of properties plunged near the outer perimeter of the lake [7].

This has been interpreted by Dr. Yuri and Dr. Juma [8] flying very fine water droplets in the air near waterfalls and fountains with a negative charge, which was named as "small droplet" that the droplets become is one of the key factors to be clouds and rain, and that means that the recruitment of science and humanitarian efforts in the field of technology, particularly in magnetic systems, sprinkler irrigation after relying on God Almighty, we can create a climate sample are the benefits of a healthy and therapeutic, whether at home or on large farms as well as the possibility of cloud formation and rain, God willing.

Environmental problems will be increased in contemporary world, which included natural resources, from its among water. This was great importance element in sustainable development and life stability of organisms in nature. The result of economic growing, technology development, urbanization expansion and demographic growing by these occurs depletion and degeneration in ecosystem. That require studying new scientific means to solving these problems by doing lowest the ratio of pollution with using renewed resources and alternative energy, which could be in secure (safe) situation with environment, from these means, magnetic method, which using in large form presently in much life fields, it was available safe energy without negative effecting in ecological direction. That the north, southern pole magnetic of the earth will be control in stability and equilibrium of earth to sustainability of life. By the result of industrial revolution occurring the world negative effecting of gases, vapors emission and sediments in water, air and soil. This development was in one side in economic field without interest in environmental side and it's protection, where its garbage caused changes in natural resources such as water, by causing acidic rain water, increasing heat jail phenomenon, expansion ozone layer, degeneration water, air and soil. This must be treating by available energy such as magnetic method, whereas 98% of water resources in the world was non potable by the reason of salinity and (pH) changes, occurs by dissolution gases acidity rain water and salts. The soil and water were the limit factors in agricultural production.

Consider the salinity in soil and in water the great problem in farming field, which effecting in germination and growing of plants in finally being lowest production in Arabic countries. For its reason to be mentioned interest in this topic (research) in using magnetic method to improve some physical, chemical properties of water and soil, which show in this study, water protection needs much researches to keep it from pollution.

Problems review

Salinity consider fundamental problems to water and soil in Arabic countries, which causing lowest activity and energy on water and soil in agricultural field. This research showing the effect of magnetization in positive form to improve some properties on water and soil by reducing electrical conductivity (E_c) and equality of acidity (pH), which clear in the following tables.

Materials and methods

Seven samples of water and soil were collected for water and soil,

where it took five of them from different regions in the province of Nineveh, the later two of them to add salt of different concentrations and that in the months of August and September of 2010, and recorded values of pH and salinity, and then kept in a refrigerator for the purpose of treatment and were also magnetizing dust samples collected from agricultural fields represent agricultural areas in Nineveh province, to represent the seven different sites in terms of seasonal rainfall and vegetation, and took seven abstracts have been taken and the same procedures for water samples. The following system was used in magnetization of water (fig. 1).

The collected samples of water were exposed to the magnetic field under special preparation by the researcher for this purpose. So that after dividing each of the samples saved into three parts, the first part of which was subjected to an hour exposed to the magnetic field caused by the engine, and underwent the second and third to two hours to three hours, then recorded the values of pH and salinity of each part after the expiration of the subordination of the magnetic field directly in the chemistry lab that belongs to the Department of Chemical Technology at the Technological Institute in Mosul. Note that those parts were placed in ceramic cups (cups) and then subjected to the magnetic field according to the specified period each part. And was also measured pH and salinity of the soil extract: water (1:1) as contained in the standard way (Page, 1982), using the device (WTW) to assess the degree of interaction of soil and salinity.

Results and Discussion

The salinity of irrigation water and soil is the biggest problems of agriculture, and the cause of this problem lies in the accumulation of salts in the soil pores, which consequently lead to a significant decrease in capacity, and that the concentration of salts in hair roots of plants results in a decrease need for plant food and thus lead to wilting and then to the death of the plant.

The research showed, and through (table 1) the values of electrical conductivity of water samples and soil comparison (control) before treatment, and (table 2) shows samples of processing, whether to water or soil a few hours of different magnet and notes that a drop in salinity in the samples affected as a result of the disintegration of the molecules of salts and thus create a suitable environment for absorption by the plant due to the fall center osmosis pacific roots.

We note from the results of table (1), when compared to the results of table (2), the clear decline in the values of electrical conductivity (salinity EC) has occurred after exposing samples of the magnetic field according to the time limit for each form. One possible explanation is that water molecules (H2O) hydrogen bonds are connected to one of these links may be bilateral or multiple up to dozens of links, when you bring those molecules of the magnetic field, these links either to change or break down, which works to absorb energy and increase the viability of electrolysis and influence the degradation of the salt crystals and the results of the study are compatible with (Sposito, 1989).

In which the pH or acidic function of pH, is a reference to the concentration of ionic hydrogen and hydroxide in aqueous solution, it is known that this exponent for drinking water is neutral at pH7, if the concentration of hydrogen ion tended solution of a number less than 7 acidic and gave him the recipe, but if less hydrogen ion concentration of the solution went higher than No.7 and gave him the basic recipe (pH= -log [H^+]). The pH of the water and soil directly affects the presence and activity of micro-organisms, as well as that plant roots respond to the pH and the rate of nutrient absorption depends upon (Torrey and Clarkson, 1995).

Note of the results (table 3) when compared to the results of (table 4), there is a slight change occurring in pH for water and soil, where the exponent tends towards the capacity of grassroots to this magnetic field on the dismantling of the water molecules H_2O and thus increase the hydrogen ion concentration, which raises the pH value PH. This affects the freedom of some nutrients, which are mainly dependent on the pH of the soil to a large extent, and was also found by (Jenny, 1994) that the absorption becomes weak, a decrease of the pH and

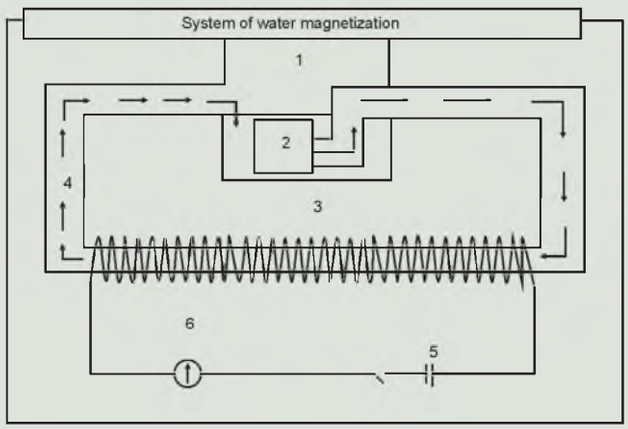

Fig. 1. Magnetic treatment system of water: *1 – basin; 2 – pump; 3 – spiral; 4 – pipe; 5 – electric source; 6 – current regulator*

Table 1. ***Shows the values of electrical conductivity of water samples and soil comparison (control) before treatment***

Sample	EC × 10^3	
	Water sample	Soil sample
1	1.5	1.53
2	0.5	1.48
3	25	2.56
4	1	0.28
5	1.4	0.51
6	1.2	0.39
7	30	14.5

Table 2. ***Shows samples of processing, whether to water or soil a few hours of different magnet and notes that a drop in salinity in the samples***

Sample no	10^3 × EC after (1)h.		10^3 × EC. after (2)h		10^3 × EC after (3)h.	
	Water samples	Soil samples	Water samples	Soil samples	Water samples	Soil samples
1	1.25	1.43	0.85	1.32	0.75	1.11
2	0.42	1.24	0.25	1.12	0.2	1.09
3	20	2.22	15	1.11	12.5	1.01
4	0.85	0.26	0.6	0.22	0.5	0.21
5	1	0.41	0.85	0.36	0.7	0.31
6	0.95	0.26	0.7	0.24	0.55	0.22
7	24	12.5	18	11.32	15	8.91

Table 3. ***Shows the values of pH of water samples and soil comparison (control) before treatment***

Sample no	pH	
	Water samples	Soil samples
1	8.5	7.7
2	7.5	7.8
3	8	7.9
4	7.5	7.6
5	7.5	8
6	7.5	7.9
7	7.8	7.5

Table 4. ***Shows samples of processing, whether to water or soil a few hours of different magnet and notes that a drop in pH in the samples***

Sample no	pH after (1)h.		pH after (2)h		pH after (3)h.	
	Water samples	Soil samples	Water samples	Soil samples	Water samples	Soil samples
1	8.5	7.7	8.6	7.6	8.6	7.5
2	7.8	7.7	8	7.6	8	7.6
3	8	7.8	8	7.7	8	7.6
4	8	7.6	8	7.6	8.1	7.5
5	7.8	7.9	8	7.8	8	7.7
6	7.9	7.8	8	7.7	8	7.6
7	8	7.5	8	7.5	8.2	7.4

thus bringing many of these elements dissolved into soil solution in acidic media, the concentration of at least some of the elements dissolved in high levels of pH and compatible with the results of the study (Jenny, 1994).

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