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Presentation of Magnetized Water and Its Application in Increasing Lifetime of Agricultural Irrigation Pipes

[1]A.R. Jamshidi, [2]M. Mahmoodzadeh, [3]E. Tayari, [4]A. Neisy

[1,4]*Department of Agricultural Mechanization, Collage of Agriculture, Shoushtar Branch, Islamic Azad University, Shoushtar, IRAN.*
[2]*Department of Agricultural Mechanization, Collage of Agriculture, Varamin- Pishva Branch, Islamic Azad University Varamin, IRAN.*
[3]*Young Researchers and Elite Club, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran.*

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ABSTRACT

Most of the waters which are entered into the farms are included plenty of mineral materials. On the one hand it can improve the taste of the water and it has a positive effect on the human health but on the other hand, mineral materials which are entered into the homes and farms when they heated and kept for a period of time, divalent ions or anions such as carbonates would formed insoluble compounds in the interior wall of tube and finally the deposition will blocked the tube. Magnetic hydrodynamic is a phenomenon which is happened when the water flows through the magnetic fields. In the Solid electromagnetic and magnetic units, magnetic field would dismiss a number of compounds that are carried in water and it would release mineral particles. As soon as releasing, these particles acting as centers of crystallization which means they absorbed mineral molecules that are around them and they stuck them in every which way. Consequently, mineral particles would stay in form of discrete and suspension compounds instead of forming mass layer inside the pipes and other surfaces. These micro crystals could be separated from water by specific filters and it would prevent of sedimentation and formation of mass inside of pipes as a result it could be cause of increasing of effective life of pipes. There are different magnetizing filters for different purposes; the most important of them are included of Flav loop filter, Rudnick filter, and magnetic funnel. The Flav loop filter is applied for preventing of sedimentation and formation of mass inside of pipes, engines wall, heat exchangers, cooling towers, and the steam boilers. By installing these magnetizing parts on the water resources of the greenhouse sedimentation would be stopped. Mineral material will be removed easily in form of heavy sludge by filters and as a result, lifetime of agricultural irrigation pipes will be increased.

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INTRODUCTION

Water is one of the world's best solvents and the most important part of human life. Always life and health of human is depended on quality of water that they consume. Water is composed of two parts hydrogen and one part oxygen and also these three atoms have the covalent bond (Anonymous, 2005). Which means, oxygen shared two of its electrons with atoms of hydrogen and then atoms of hydrogen shared their single electrons with atoms of oxygen, thus this kind of molecular structure is called a dipolar molecule (Anonymous, 2006). This means, molecule has the positive charge at one end and the negative charge at another end. Water solubility is largely due to this bipolar structure (Mahdavi, 2009). Water could solve in itself all the organic materials and many of the inorganic materials in determined and sufficient time. Generally water surrounds all the foreign particles, such as mineral materials so it usually has a high content of minerals. These dissolved particles are not part of the water but rather they are surrounded and transported by water. Figure 1 shows dissolved ions which are surrounded by polar molecules of water.

Corresponding Author: A.R. Jamshidi, Department of Agricultural Mechanization, Collage of Agriculture, Shoushtar Branch, Islamic Azad University, Shoushtar, IRAN.
E-mail: (aminrezajamshidi@yahoo.com)

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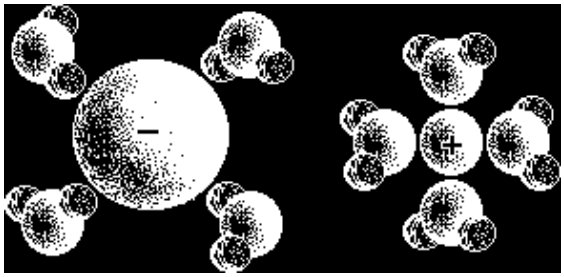

Fig. 1: surrounded dissolved ions by polar molecules of water

Technically, hard water is water that has high mineral content such as calcium carbonate and etc more than 60 mg/lit (Anonymous, 2004). Due to intrinsic electrical charge, temporary ionization stages and associated micro crystals, minerals dissolved in the water tend to form a large crystal of limestone strongly. This state of mineral crystallization is appeared in the form of sedimentation and mass on the wall of pipes, valves and water heater elements (Columbus, 2003). The most of the waters which are entered into the land, the building and the home they have a lot of minerals. On the one hand, these minerals water improve the taste of water and has a positive effect on human health. On the other hand, divalent ions, or anions such as carbonate form insoluble compounds in the interior wall of the pipes and finally sedimentations will blocked the pipes when these minerals heated and kept which are entered with water into the homes or the agricultural lands. These issues not only are causes of disturbances in house holding and agricultural consumption but also in the manufacturing, industries and swimming pools consumption. These sediments are causing the depreciation of pipes and irrigation equipment and also removing sediments from pipes cost heavy. New techniques are discovered and developed by developing of science and technology for dealing with this problem. Currently the most common method is chemistry desalination of water which is based on the using bicarbonate. This method has problems in terms of durability and cost and also the most important of them are as follows:

1 - High loss of the water relatively up to 20%.

2 - Using the Bicarbonate, 1 kg for 1000 liters of the water which involves a high cost.

3- Failure to effect on sediment and mass formation in the pipes.

It is thought that the water after passing through these stages would be clean water with the best quality, while this water is dead water. In fact, we as humans would be cause of killing water by mechanical, thermal and chemical activities in purpose of water Filtration, which means we destroy its vital energy completely. Water gets its energy from the sun and it collects the energies which are stored in the ground. In the summer, water will arrived itself to ground level by strong solar energy and in the winter, water will sunk into depth of ground by reducing solar energy. Flow water through the pipes under pressure is the first step in the destruction of the natural energy of water because a high pressure for energy of water is detrimental (Jamshidi and tayari, 2005). The ancient, China and Indian physicians have so much attention to magnetism and amber. Specifically, first time magnetic water was produced by three scientists from Russia who worked at academy of medicine. They fed bipolar magnetic water to their patients because it had a powerful impact on breaking kidney stones. Nowadays, using of magnetic water and electromagnetic fields has been usual and customary in all around the world. Accordingly, scientists are achieving new developments in this field every day.

Magnetizing equipment:

Solid magnetism equipment: At the beginning was used unstable simple steel magnetic but along with the development and the progress of science, a new generation of stronger and more sustainable magnets was built which have been composed of the rare earth metal compounds such as cobalt and ferrite and they called the ceramic magnetic. In compare to the old and the steel magnetic, the ceramic magnetic have power more than hundreds times and also these magnetic are more durable and stable. Indeed, these magnetic do not need to recharge and they are used in the nuclear submarines due to this feature. Using of these magnetic began after the Second World War; figure 2 shows the Ceramic Magnetic system (Mahagoub, 2006).

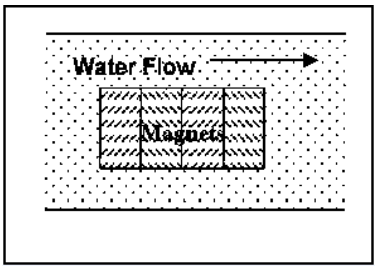

Fig. 2: The Ceramic Magnetic system

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Electromagnetic devices: This magnetic field is produced by electromagnetic based on this the pipe is placed into a coil; subsequently the electrical current passes through it. As result, a comprehensive magnetic field is generated; Figure 3 shows the electromagnetic system (Mahagoub, 2006).

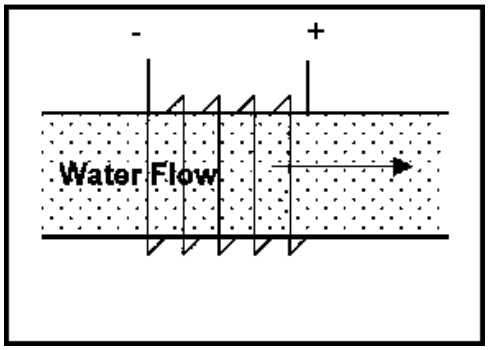

Fig. 3: The electromagnetic system

Electrostatic devices: The electric field will be produced from the current by installation of electrodes which an electric current passes through them and also formation of a magnetic field. Finally the electric field will be influenced over the current and then absorption and desorption of ions will be happened; Figure 4 shows the electrostatic system (Mahagoub, 2006).

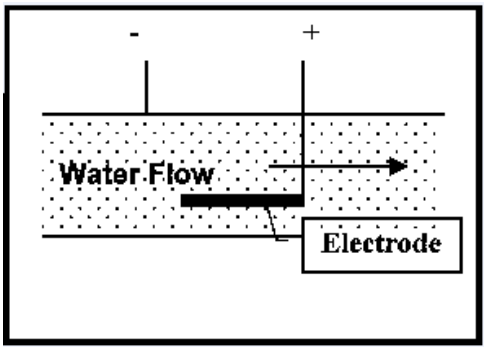

Fig. 4: The electrostatic system

Methodology:

The action mechanism of magnetic field:

In the quantum physics laws, uncharged particles are in a normal or Para situation, when particles are charged magnetically, exited electron changes its orbits parallel to the surface of magnetic pole. This high energy is known as Ortho mode this time protons will shift in the opposite magnetic poles this action will be caused of formation of a the bipolar mode. Magnetic field will be prevented the formation of mass by changing in the molecular structure of liquids (Kulish, 2000). Furthermore, current sediment on the interior surface of the pipe will be eliminated while the treated water is used continuously. Most of the people may assume the water that is exposed at least to one pole of the magnetic it will be magnetic water. Whereas, magnetic field will be effective when, it could change at least in one of the water features. Magnetizing of liquids will be cause of physical and chemical changes in parameters of natural water and finally it leads to improved properties of water filtration. Generally, water will acquired uniform structure by passing through the magnetizers. Basically, 14 properties of water will be changing such as smell, taste, electrostatic tensile or surface adhesion, properties of water solving (Mahagoub, 2005).

Fig. 5: The effect of the magnetic force on the water molecules

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Effective factors on rate of the magnetic water:
Length of the magnetic:

In fact the strength of each magnetic is dependent on its diameter and rate of the magnetic field or length of magnetic (Makhmodov, 2004).

How to Place the magnetic:

The rate of magnetization is more when different poles are placed in one side of pipe in compare to the case that similar poles are placed together (Makhmodov, 2004).

Water flow rate:

Water flow rate or velocity is effective on magnetic treatment. In this case, whatever rate is lower the effective of treatment on the rate will increase more markedly. In fact, capacity of the magnetizing components is determiner for flow rate of water passing through the device. Production companies generally suggest velocity of water flow of 2.1 m/s (Makhmodov, 2004).

Material of the pipe:

According to experiments, material of the pipe is effective on magnetization of fluid. As an example, the pipes which are made by PVC decrease calcium ion rate to about 18%. While, in the pipes which are made by steel and copper in the same condition these ions decrease by approximately 28% (Makhmodov, 2004).

Types of magnetizing water filters:
Sumo filters:

This system is designed for household water filtration and magnetizing, figure 6 shows the Sumo filter.

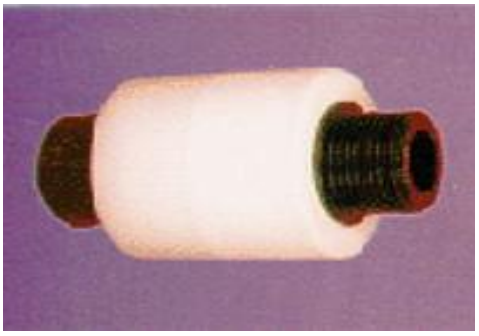

Fig. 6: The Sumo filter

Rudnick filters:

This device is applicable for water disinfection and newly drilled wells and these filters are compact and portable and it is recommended for using in travels and the places where the water quality is unknown.

Flav loop filter:

This filters are used for Seeds magnetizing, figure 7 shows the flav loop filter (Gabrielli, 2003).

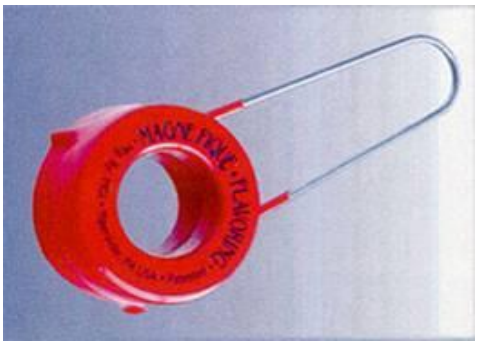

Fig. 7: The flav loop filter

Magnetic funnel:

Magnetic funnel is the most efficient and effective means to magnetizing fluid. Fluids will gain smoother and uniform structure after passing through the funnel. As a result, it increases the fluidity and strength

solubility of fluid. Magnetic water which is obtained from this device has therapeutic and preventive effects on pain caused by kidney stones. The unique properties of output water from the funnel is due to observing all the standard rules for the construction of a magnetizing device such as length and number of magnetic used, how to place poles, velocity and flow rate of output water because of the specific shape, figure 8 shows the magnetic funnel (Gabrielli, 2003).

Fig. 8: The magnetic funnel

Discussion:

Application of magnetic water in the industry and irrigation pipe:

Sediment and mass on the surfaces of the pipe form many problems; in the most of the industrial units are formed these sediment on the heat exchanger, cooling towers and boilers. This factor is causes of increasing fuel consumption and reducing heat transfer to the fluid. As an example a sedimentary layer with a thickness of 1.5 inch could reduce heat transfer by up to 70% and increase fuel consumption by up to 30%. Sediment forming will stopped by installing of these components on the magnetizing water suppliers and also minerals such as heavy sludge can be easily removed by the filters (Gabrielli, 2003). Effect of magnetic field on the efficiency of internal combustion engines is also very significant. In effect of using these components surface of the carburetor or injector be kept clean and also mass of burning the carbon will not remained on the valves and combustion chamber. Magnetic fuel has tendency to absorb oxygen molecules while mixing with air in the cylinder; As a result combustion efficiency will increased and ultimately more energy will produced. All these factors will be causes of increasing the mileage per unit of fuel consumption. This fuel is very frugal fuel for private cars. Indeed, fuel consumption will be saved by using magnetic treatment up to 30%. In addition, due to reduce emissions of carbon monoxide and hydrocarbon exhaust up to 85% these filters will used for reducing of environmental pollution and protecting of the ozone layer (jamshidi & Tayari, 2005).

Conclusions:

According to the information which is obtained, there is no research on this new technology that has been conducted in Iran; this is an opportunity for agricultural experts and students increase their scientific position by using these conditions and with continuous and accurate research on this scientific topic. Furthermore, position of this technology will be improved among farmers and industries by establishing linkage between academic departments with research centers of agriculture ministry, agro-industry, and Energy ministry. It is obvious that research by students and researchers will result in building up fabricate devices; and effectiveness of these devices in compare to their foreign similar will help to self-sufficiency of the country (Iran).

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