The Effect of Magnetic Water on Growth of Chick-Pea Seeds

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.

Abstract:
Magnetized water has been experimented on chick-pea seed growth. Seeds are growing in plastic cups for 18 days and irrigating with magnetized water which prepared by using static magnetic field. Plants lengths are taken daily up to the day 18. Length results show that seeds irrigated with magnetized water were taller than seeds irrigated with tap water. The difference in length was (2.67 cm) between them.
Key words: Magnetic water, chick-pea seeds

الخلاصة:
تم اختبار تاثير الماء الممغنط على نمو بذور الحمص . البذور زرعت في اقداح مدة 18 يوما وسقيت يوميا بالماء الممغنط الذي حضر باستخدام مجال مغناطيسي ستاتيكي. اطوال النباتات قيست يوميا لغاية اليوم الثامن عشر . اظهرت النباتات المسقية بالماء الممغنط اطوالا اكبر من تلك المسقية بالماء العادي , حيث كان الفرق بالطول حوالي (2.67سم) بين المسقية بالماء الممغنط عن المسقية بالماء العادي

Introductin:

Water and life are closely linked. This has been recognized throughout history by civilizations and religions and is still the case with scientists today [1]. Liquid water is required for life to start and for life to continue. No enzymes work in the absence of water molecules. No other liquid can replace water. The development of life required this water. How exactly this was achieved, is a question that has interested many since well before the early experiments producing amino acids from simpler molecules by electric discharge in aqueous systems [2]. More recently, various theories have been propounded but without a consensus except for the key involvement of liquid water [3]. Water possesses particular properties that cannot be found in other materials and that are required for life-giving processes [4]. These properties are brought about by the hydrogen-bonded environment particularly evident in liquid water. The hydrogen bond in liquid water is highly affected by electrical and magnetic fields [5, 6].It is found that some physical and chemical properties changed when water pass through magnetic field .Therefore the so called "magnetized water" has different chemical and physical properties and action than ordinary water. N.Hirota.et al 1999 [7] have studied the effect of a nonuniform magnetic field on the germination of plants were studied. When a 10T magnetic field was applied at the center of a superconducting magnet, a cucumber shoot germinating in a horizontal bore leaned towards the field center. In contrast, the root grew in the direction opposite the shoot. M.mathur and Le zhang

2003[8] have reported the effect of a static electromagnetic field on the root growth of radish seeds and the number of root hairs was growing on these roots. The results showed that although the static electromagnetic field had no effect on root length, there was a significant increase in the number of root hairs. In this paper we demonstrate the action of magnetized water on seed growth . The symmetrical seeds groups (ten seeds per group) treated in different type of water (magnetic and non magnetic water) so as to figure out the influence of magnetic field on water as well as on seeds.

Experements:

Two groups of chick-pea (*Cicer arietinum L.*) seeds are selected with ten seeds for every group. The criteria of selection depends on their size, weight (They approximately have the same size and weight), clear light yellow color and have free surface defects. Every seed sowed in a plastic cap (4.5cm height, 7cm upper diameter, 5cm lower diameter) in 3cm depth of soil. Group (1) irrigates daily with magnetized water, otherwise, group (2) irrigates with tap water. Magnetic water prepared using permanent magnets (0.32T) which positioned out side polymer container in opposite pole configuration[9]. The water remain in container for 24 hours before using .Each seed in every group was irrigated daily with about 20ml of water .After four days the plants became to grew over the soil level ,and after that day the measurements took place for every day.

Results & Discussion:

Two chick – pea plants from group (1) and three from group (2) (control group) failed to germinate .The sample size was thus reduced to eight for group (1) and seven for group (2) .The data collected throughout eighteen day period is presented in table (1) (for experimental group) and table (2) (for control group).The average values for plant length for experimental and control groups began to diverge between day 3 and day 4.

The final length values were taken on day 18 .From these, it was found that the average length of experimental group was (2.67 cm) more than the average length of control group. The difference in length between any two plants in group is very obvious as shown in figure 1. Average length for both groups are plotted vs. time as in figure 2.Its clear from figure 2 that during day 1&2 the two groups have the same average length, and after that (day 3 up to day 18) the difference increase. The magnetic field affect on water properties ,its found that pH value changed from ~7 to 7.6 and conductivity(σ/σ_o) to 4.29 while the surface tension reduce by 2% .According to this results, it's obviously that magnetic field has significant effects on water and therefore on plants. Static magnetic effects have been shown to cause an increase in the ordered structure of water formed around hydrophobic molecules and colloids [10] as shown by the increase in fluorescence of dissolved probes [11] this reinforces the view that it is the movement through a magnetic field, and it associated electromagnetic effect, that is important for disrupting the hydrogen bonding. Such fields can also increase the evaporation rate of water and the dissolution rate of

oxygen but cannot, despite claims by certain expensive water preparations,

increase the amount of oxygen dissolved in water above its established, and rather low, equilibrium concentration [12]genetic fields can also increase proton spin relaxation [13]which may speed up some reactions dependent on proton transfer. Dissolving properties of water increase when treated with magnetic field. It is known that plants and trees need mineral salts and microelements from the soil to function and photosynthesize properly. However, plants do not use the majority of nutrients that are in soil. While watering plants with normal water, only a small amount of nutritional element dissolves in the soil and becomes available to the plants. Further consumption of these nutrients from the soil is very rare when plants start to grow and a larger amount of nutrients is required, the deficit of microelements results in low numbers of crop. The deficit of microelements/nutrients in the soil is the main reason for a decreased growth rate and low crop. In addition, when the plant is irrigate using hard and non- magnetized water, white coating is formed on the surface of the soil: that is calcium bicarbonate and carbonate Some of calcium bicarbonate is washed away by water penetrating soil and depositing on the roots of plants. The plant, then, starts to suffocate because of these depositions and in order to continue to feed, forms additional roots. This process results in a decrease of normal growth in plants. However, plants that are irrigated using water that is treated by magnetic field, easily take in mineral salts from the soil and no sediment is formed on the soil surface. This results in an increased crop production and in an increased quality of agricultural products.

Conclusion:

Magnetized water has very affective effects on seeds. The crop production and plant length increase noticeably. Treating water with static magnetic field increases its solubility of salts .Seeds irrigate with magnetized water acquires more nutrients from soil. Increasing of soil salts enhancement the photosynthesize property of plants.

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