

Short Communications

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Study on the Effect of Magnetic Water on the Yield of Bhendi

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ABSTRACT

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Magnetic water technology is a promising method of improving the quality of water and also for the crop. Magnetised water means the water which is treated with the magnetic field. This magnetized water has been successfully used in irrigation during our field trials on the Bhendi plant. With this effect, we can able to study the biological effect of magnetised water on plants. This study has shown that there is a significant improvement in the growth and yield parameter of bhendi crops.

Introduction

Nowadays the peoples were focusing on the novel methods which improve the yield and growth parameter of the crop. But the farmers were in fear that introducing novel methods such as magnetic water, electric water may result in a reduction of yield. Magnetised water means the water which is treated with the magnetic field (Racuciu and Creanga, 2005). Magnetic water is based on the principle that a Lorentz force is exerted when the water passes through the metallic softener. The force is exerted on each ion in the opposite direction. The deflection of these particles which in turn increases the frequency of collisions between ions of

opposite side combining to form a mineral precipitate or insoluble compound. Magnetic treatment of saline irrigation water can be used as an effective method for soil desalinization. Due to the interference activity of water molecules, it will lose the polarity and form a natural cluster. These cluster formations will retain the suspending pollution particle. These processes improve the efficiency of water absorption in plant and animal cells. Magnetizing water reverts an even molecular distribution, recharging the molecules, efficient use of water. Magntised water maximizes the nutrient absorption with less water intake. Magnetic water treatment consists of an H₂O energizer that creates the magnetic field when applied to the normal

water that disintegrates the water molecule into small water hexagonal-shaped water molecule. This hexagonal cluster is recognized by the cell as "bio-friendly and it enters in the plant and animal cell membranes. As magnetic water is having so many advantages so the present investigation was focused on the objective to study the impact of magnetic water on the yield of Bhendi (Okra).

The use of magnetic treated water in agriculture which offers advantage such as improved yield, water economy, reduction in the plant diseases, quality improvement in crops, increased fertilizers efficiency and reduction in cost of farm operations.

When water passes through a magnetic field, its structure and some physical characteristic such as density, salt solution capacity, and deposition ratio of solid particles are to be changed Higashitani *et al.*, (1993). Muraji *et al.*, (1992) observed that magnetic water (MF) treatment increases the root growth of corn.

Muraji *et al.*, (1998) discovered that there was an enhancement in root growth of maize (Zia maize) by exposing the maize seedling to 50 G magnetic fields at alternating frequencies of 40-160 Hz. However, there was a reduction in primary root growth of maize plants grown in a magnetic field alternating at 240-320 Hz. The highest growth rate of maize roots was achieved in a magnetic field of 50 G at 10 Hz.

Podleoeny *et al.*, (2004) reported that exposing the broad bean seeds to variable magnetic strengths before sowing imposes significant effects on seed germination and seed yield. In addition, they showed that applying a magnetic field to broad beans during the growing season can increase the number of pods per plant and reduce plant losses per unit area.

Materials and Methods

This chapter deals with the various materials and methodology adopted for the study of yield and growth parameter on Bhendi

Fabrication of magnetic device

The magnetic device comprises a magnet and plastic pipe. The strength of the magnet is 126mT. The outer diameter of the magnet is 75 mm and the inner diameter of the magnet is 25 mm. The thickness of the magnet is 50 mm and the diameter of the pipe is 25 mm. The magnet is fitted on the plastic pipe in such a way that water passes through the pipe without wetting the magnet. The length of the magnet was selected in such a way so water passing through it has proper exposure to the magnetic field. The outer diameter of the magnetic device has provided proper insulation in order to prevent the loss of the magnetic field. The fabricated magnetic device is shown in plate fig. 1.

Field layout has been selected for a field with dimension of 21×9 m as shown in fig.2 and was divided into two plots for control and treated water flow. Totally six beds which were divided into two parts first three beds were treated by magnetically treated flow and next three beds were treated by control flow. The width of each bed was 1 m. Plant to plant and row to row spacing of the crop is 60×60cm. Seed rate of Bhendi crop was 4kg/hectare. There were 466 plants in the both the plots of the trial field.

The complete setup of magnetic device was installed in the field as shown in fig.3. This setup consists of plastic pipelines as sub main for drip irrigation. Size of sub main was selected as 25 mm as per internal diameter of the magnetic device. There was a provision of non-return valve by which flow from magnetic device should not mix with control

flow. Magnetic device was fitted in the pipeline and pipelines are spread in such a way that half of the pipeline covers one plot and another half pipeline was covering second plot. The magnetic device is fitted one side of the pipeline. Once the water passes through the magnetic device, it is magnetized. To prevent this water to return back non return valves was used.

Growth parameters

The plant parameters such as plant height, number of branches per plant were measured and it was compared with control flow plot. There was a measurable difference observed between control and magnetic water treated plots.

Yield comparison

In order to check whether yield is changing by the effect of magnetic field treatment on irrigation water periodic yield was noted down from both the plots. Finally average yields from both the plots were compared. For comparison of yield proper record of periodic yield was maintained and finally all the data were analysed.

Results and Discussion

The result obtained from both the plots was noted and it was observed that an average of 11.62% higher yield was recorded while using the magnetised water. The observed yield was plotted and shown in the Fig.1 and Table 1.

In order to evaluate the growth parameter, the plants height has been measured from all the replications and plotted as shown in table 2 and Fig 2.

Field experiments on the treatment of water using the magnetic device have proved that water-activated using a specific arrangement

of magnets and their housing helps to improve the quality of water for irrigation. Magnetically treated water used for irrigation of bhendi plants has resulted in a statistically significant increase in the yield. The observations on quality assessment indicate that magnetic treatment enhances the overall physical characteristics of the fruit. It has also been observed that magnetically activated water used in agriculture helps for the improvement of plant growth, fruit and crop yield. While comparing the yield parameter with the control it has been shown that the yield of Bhendi is improved to 11.62%.

In conclusion the magnetic treatment of irrigation water resulted in statistically significant increases in the Bhendi yield. This technology can be recommended to farmers, it will be clear to understand the mechanisms and processes that affect plant yield through the magnetic treatment. The conditions under which it will work will the extent of its effectiveness under field situations.

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