

RESEARCH NOTE

Magnetic water : a plant growth stimulator improve mustard (*Brassica nigra* L.) crop production

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A water treated with magnet is called as magnetic water. Magnetic water when applied to normal water, restructure the water molecules into very small water molecules clusters, each made up of six symmetrically organized molecules. This miniscale cluster is recognized by cell as bio-friendly due to its hexagonal structure, because toxins can't travel within the cluster and easily enter the passageways in plant and animal cell membrane. The result provides maximum healthy hydration with less water for the preparation of magnetic water (South pole energy increased tubes with north pole energy produced larger above ground plant). Magnetic water is useful to promote plant growth; in which 30 per cent growth occurs. It facilitated the plant growth as magnetic field neutralize water element. Treated Seedlings markedly improve imbibitions and germination of seed. Seedling treatment promotes NPK absorption and increases the stem thickness, increases leaf lamina as well as increases tiller numbers, pod size. Irrigated plant with magnetic water increased chlorophyll content, nitrate reductase activity and reduced permeability of cell membrane at low temperature.

Key words : Magnet, Agriculture, Growth, Mustard seeds (*Brassica nigra* L.), Magnetic water

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Brassica nigra L. (black mustard) rajakshavak or Kali Mohari is an annual weedy plant cultivated for its seeds, which are commonly used as a spice. The spice is generally made from ground seeds of the plant, with the seed coats removed. The small (1 mm) seeds are hard and vary in colour from dark brown to black. They are flavorful, although they have almost no aroma. The plant itself can grow from two to eight feet tall, with racemes of small yellow flowers. These flowers are usually up to 1/3" across, with four petals each. The leaves are covered in small hairs; they can wilt on hot days, but recover at night. Magnetic water (also known as anti-scale magnetic treatment or AMT) is a controversial method of supposedly reducing the effects of hard water by passing

it through a magnetic field, as a non-chemical alternative to water softening. Magnetic water was first used in Russia by three specialist Dr. G. Gerhensh Chikow, I. Shetsov and K. Tovstoles, all three specialists in urology at the kirov military medical academy in Leningrad. Hirota *et al.* (1999) and Atak *et al.* (2003) have studied the effect of non uniform magnetic field on germination of plant were studied. "Magnetic water" has different chemical and physical properties and action than ordinary water. According to Harichand *et al.* (1995) reported that exposure of magnetic field (10 MT;40T) increases plant height, seed weight per spike and yield of wheat.

Magnetic field treated seeds shows accelerated protein biosynthesis, According to research of stein and

Lian 1992, Goodman et al.(1995) and Atak *et al.*(2003). Magnetic field affected the growth characteristics and various function like m-RNA quality, gene expression, protein biosynthesis and enzyme activity and caused changes concerning the various function at organ and tissue level. In broad bean (*Phaseolus lunatus*) and pea (*Pisum sativa*) cultivars the magnetic stimulation of seeds improved the sprouting and emergence of seed and resulted in higher pod number and seed yield. The similar work was done and demonstrated by Podlesny *et al.*, 2005 and Podlesny *et al.*, 2004 and showed that electromagnetic field increases the plant growth especially percentage of seed germination

Alexander and Doijode (1999) noted that aged onion (*Allium cepa* L.) and rice (*Oryza sativa* L.) seeds exposed to a weak electromagnetic field for 12 hr increases the germination, shoot and root length of seedling.

Keeping this view in mind an emphasis was done in present study the focus was being given to demonstrate the action of magnetic water on seed germination, physiological and morphological changes.

Mustard seeds (*Brassica nigra* L.) were selected having 50 seeds for every group, each group contain three replications with control. Seed selection criteria depend on size weight (Approximately have the same size and weight). For germination study seeds are soaked in magnetic water and control for 5 hrs. Magnetic water treated seeds number 50 were kept in Petri dish containing soaked cotton, remaining 50 seeds were sowed in soil bed. Same procedure was followed for control. Daily water was applied according to treatment. Day to day measurement took place.

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Growth criteria:

Present work was carried out to study the responses of growth, floral bud, leaf lamina size, stem thickness and pod size. Mustard plant irrigated with magnetic water exhibited highly significant increases in plant height, stem thickness, leaf size, flower number and pod size as compare to the normal plant. Seed treated with Magnetic water showed higher germination percentage than control. When plant irrigated with magnetic water show significant increases in physiological and morphological changes, this increases reached to 30 per cent. In case

of seed germination electromagnetic field increase the rate of seed germination. According to Pietruszewski (1996) revealed that wheat seed treated by M.F can speed up germination compare with untreated sample.

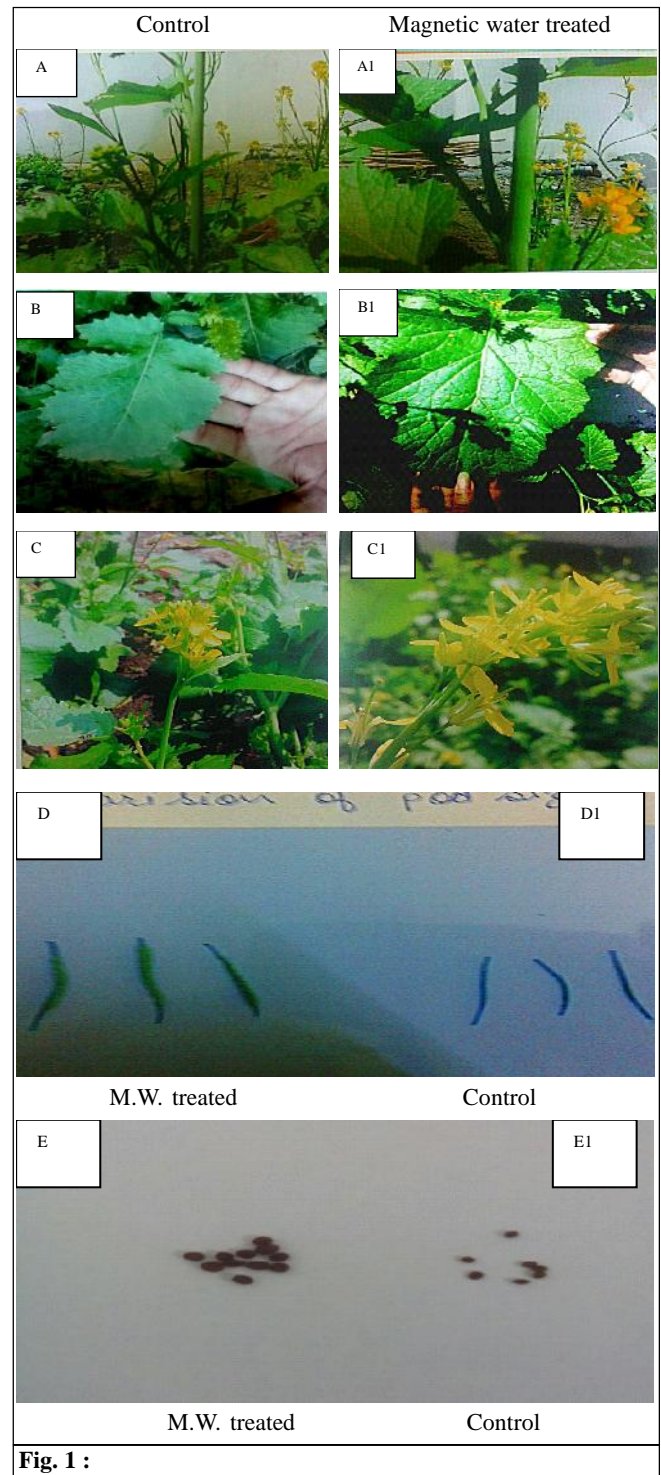


Fig. 1 :

Sr. No.	Treatments	(Observation) No. of days	Treated seed			Control	
			M.W	M.W	M.W	M.W mean	Tap W. Mean
1.	Seed germination	3	27	33	35	31.66	20
2.	Height of stem(cm)	35	51	53	55	53	38
3.	No. of bud	41	5	4	4	4.3	0
4.	Stem diameter(cm)	51	3.5	3.5	4	3.66	2.5
5.	Length of leaf lamina(cm)	55	22	22	21	21.66	14.2
6.	No. of seed in each pod	55	16	13	15	14.66	9

Vegetation period of mustard is near about 41 days. California state polytechnic state that kronenberg contributed to the pioneering work in agriculture that reused re energized irrigation water with magnetic treatment says magnet actually change the nucleus of water.

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