

Effect of Agnihotra on the germination of rice seeds

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Vedic ritualistic sacrifices have been in vogue in India since time immemorial. Recently they have become very popular around the globe because of their therapeutic values. An important component of these sacrifices are the *mantras*, which are sound forms reputed to contain mystic energy. The most common sacrifice still being practiced in India is the *Agnihotra*, which involves ritual offerings to the fire at sunrise and sunset to the accompaniment of specific *mantras*.

This practice was revived in Akkalkot, Maharashtra, and is being popularized throughout the country. In the current investigation, rice seeds were germinated in four rooms in petridishes for a period of 15 days. One room was used as the control with germination under normal conditions. A fire was lit in a second room for a specified period at sunrise and sunset. In a third room, Agnihotra *mantras* were chanted at the same time of the day, but no fire was lit. The last room was the experimental room, in which the full Agnihotra ritual, with fire and *mantra*, was conducted at sunrise and sunset.

Three sets of data were collected for three seasons, autumn, winter and summer for a period of 15 days each. Four parameters, viz. Root length, shoot length, fresh weight and dry weight were measured. An analysis of the data showed that the Agnihotra sacrifice with *mantra* was overwhelmingly more effective in the germination process than the other three cases. Statistical analysis of the data using the standard SPSS package corroborated this conclusion.

Keywords: Agnihotra *mantra*, Germination, Rice seedlings, Vedas.

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Agnihotra is a form of *Homa* or sacrifice, which finds mention in the Vedic literature. It is the truncated version of an important sacrifice known as *Darsapurnamasa Isti*, which is referred to in the *Srauta Sutras* of *Baudhayana*, *Apastamba* and *Asvalayana*. The word *Homa* is collectively used to denote Vedic techniques, which are employed for the purification of the atmosphere. In ancient

Vedic culture, it was used in various areas such as Bioenergetics, Psychotherapy, Medicine, Agriculture, and Climate Technology, etc. Efficacy of *mantras* and Agnihotra on mind and body¹, smack addicts², scabies in animals³, microbial content of the atmosphere⁴, skin wounds⁵, and radio activity in the atmosphere⁶ have been reported. Agnihotra ash is the ash obtained after the sacrificial offering. The materials used in Agnihotra are as follows:

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Yajna trees (twigs)

- Vata (*Ficus bengalensis*)
- Audumbara (*Ficus glomerata*)
- Palaash (*Butea frondosa*)
- Peepal (*Ficus religiosa*)
- Bel (*Aegle marmelos*)

Cow dung cakes, 2 drops of cow's ghee smeared to the pinches of rice and offered.

A *mantra* is a sound form, which has been used for spiritual practices in almost all religions of the world since time immemorial. In Vedic culture, *mantras* were usually associated with sacrificial rites. Even today one can witness various types of Vedic sacrifices in India, performed to the accompaniment of *mantras*. More details about *mantras* and sacrifices are available in Jina Devi⁷.

The Agnihotra *mantra* is recited by a large number of people in India. When the sun is just rising, pulsations of all life forms are intensified. The reverse phenomenon occurs at sunset. It is at these times that the Agnihotra *mantra* is chanted, accompanied by oblations poured into a fire.

Vedic people believed that the Agnihotra *mantra* with certain mystical properties helps in capturing of cosmic energy. The combustion products released into the atmosphere during the pouring of the oblations help in cleaning the atmosphere and removal of many pollutants. These ideas found wider acceptance among the ancient people of India, and many other ancient cultures of the world.

Of late, there has been a revival of these ideas not only in India, but also around the world. A search conducted by

us on the Internet revealed that as many as 11 countries around the world have taken to this practice, some of them being Germany, USA, China, Japan, UK, etc. Reports from these countries talk of Agnihotra ash being used along with conventional organic manure in fields to improve the quality and quantity of agricultural yield. There are also reports of Agnihotra ash being used for medicinal purposes. These reports talk of the significant improvements brought about by Agnihotra, but none gives detail of any systematic controlled studies conducted to substantiate these claims.

The most systematic use of Agnihotra was reported in India for the first time by the Institute of Vedic Studies at Akkalkot, Maharashtra. It is said that the famous Hathayogi, Gorakhnath had practiced Agnihotra in a place called Siva Kshetra, now called Tapovan, near Akkalkot. This practice, which had fallen into disuse, was recently revived by Sadguru Sri Gajanan Maharaj (1918 - 1987)⁸⁻¹⁰.

Another systematic study of the impact of Agnihotra on crop production was conducted on wheat, according to three systems of farming — Homa Farming System (HFS), Usual Farming System (UFS) and Natural Farming System (NFS), the last being the control¹¹. A brief description of the methodology is given below.

In the Homa Farming System, wheat seeds (variety K816) were treated with a solution made from cow-dung, cow urine and Agnihotra ash. Four cemented pots were filled with soil mixed with Agnihotra ash. No fertilizers were added. Agnihotra was practiced during sunrise and

sunset. Every seventh day a mixture of Agnihotra ash and *homa* ash was sprayed on the plants.

In the Usual Farming System, ordinary ash replaced Agnihotra ash. The soil in the pots contained standard doses of NPK fertilizers and the procedure was the same as described earlier.

In the case of control, (Normal Farming System), the procedure was the same as in the previous case, except that no fertilizers were used. The parameters observed were percentage of germination, period of maturity, plant height, number of tillers and grain yield per plant.

HFS showed a faster rate of germination than the other two cases. The plants raised had a greater height, a larger number of tillers per plant, a better vigor and the highest grain yield per plant as compared to the other two cases. The same kind of results were obtained in the case of mustard and vegetables.

A study was also undertaken to record the effect of Agnihotra on the germination of rice seeds¹². The study consisted of reciting Agnihotra *mantra* at sunrise and sunset in a room in which a fire was lit and offerings were made. The room contained 15 petridishes, each containing 25 rice seeds, placed on Whatman filter paper moistened by distilled water. Two other rooms were used as control, one with fire only and the other without fire or chanting.

Data were taken every day by measuring root length, shoot length, fresh weight and dry weight of seedlings from one petridish from three rooms. The measurements of 25 seedlings were averaged for each day. The experiment lasted for 15

days. The root length, shoot length and fresh weight were noticeably higher in the case of Agnihotra than in the other two cases. The dry weight, however, was the same in all situations¹³.

Material and Methods

The materials used for the present experiments consisted of the following:

- (a) A pyramid shaped copper pot, 14.5 cm x 14.5 cm at the top, 5.25 cm x 5.25 cm at the bottom and 6.5 cm in height.
- (b) Dry twigs and cow dung as mentioned earlier.

The experiments were conducted in four rooms identical in all respects. One room was used as a control room, in which seed germination took place in a natural way without the use of Agnihotra *mantra* or the sacrificial fire. In the second room, the sacrificial fire was lit exactly at sunrise and sunset, but no *mantras* were chanted. In the third room, only the *mantras* were chanted at the appropriate time, but no fire was lit. The fourth was the experimental room, in which the sacrificial fire was lit at the appropriate time of sunrise and sunset. The following *mantras* were chanted once, and the whole process took about 10 minutes.

Sunrise:

Om Suryaya Swaha, Suryaya idam na mama;

Om Prajapataye Swaha, Prajapataya idam na mama.

(Our salutations to the Sun and the Creator; these offerings belong to them and not to me)

Sunset:

Om Agnaye Swaha, Agnaya idam na mama;

Om Prajapataye Swaha, Prajapataya idam na mama.

(Our salutations to the Fire and the Creator; these offerings belong to them and not to me)

Data of the first room served as the control, while those of the last room were the experimental data for analysis. The data from the second and the third rooms were helpful in separating the influences of the sacrificial fire and the *mantra*.

In each room 15 petridishes of 6 cm diameter were kept with Whatman's filter paper wetted with distilled water. At the start of the experiment, 15 uniform rice grains of variety IR 20, procured from the University of Agricultural Sciences, Bangalore, were placed in each of the petridishes. Distilled water was added to each petridish and readings were taken at the interval of 24 hours till the fifteenth day.

Every morning, one dish at random was picked from each of the four rooms, for measuring shoot length, root length, fresh weight and dry weight. The experiments were conducted in three stages. The first set of data (set 1) was collected in the month of October, corresponding to the autumn season. The second set (set 2) was collected during the month of December and the succeeding January. The last set (set 3) was collected during April and May, corresponding to the summer season.

Results

The four parameters investigated were shoot length, root length, fresh weight and dry weight. The data were taken under four different conditions: Agnihotra fire

with *mantra* (A), only fire (F), only chanting (C) and no fire and no chanting (N), the last one serving as control. These data have been studied not only season-wise, but also in totality to eliminate seasonal variations.

In Karnataka, where these experiments were conducted, the season for sowing is usually in summer and crops like rice are reaped in winter. The rate of growth of the seedlings in the summer and autumn seasons was found to be marginally influenced by Agnihotra. But the data for the winter season showed something interesting. The control showed hardly any growth of the seedlings. The data for only fire and only chanting showed marginal increases in the rate of germination. However, the data for both fire and chanting revealed a remarkable increase in the rate of growth of the rice seedlings, thus indicating that even in circumstances in which growth of rice seedlings is inhibited, the practice of the Agnihotra sacrifice with *mantra* recitation has a remarkable influence on the rate of growth of the seedlings.

The length of the root showed a predominantly high rate of growth as compared to the others. There was not much variation between the data for the control and those for only chanting (C). However, the data for only fire (F) showed a marginal increase (Fig. 1). This could be due to the marginal increase in the temperature of the ambience. Increase in temperature was of the order of 2 or 3 degrees Celsius. It is quite well known that a warm environment accelerates the growth rate of plants. Even though the temperature rise here is not of that order, it still seems to be

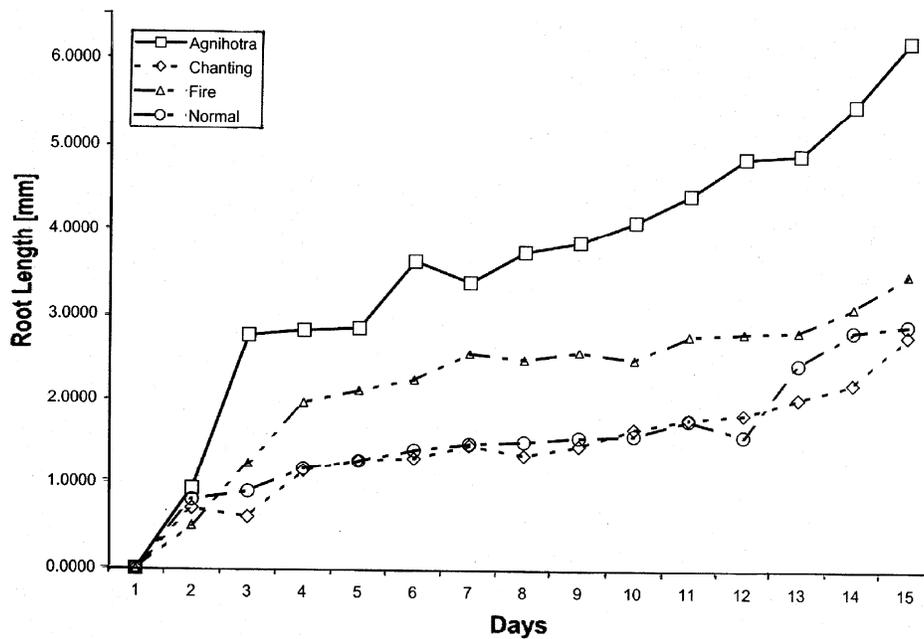


Fig.1: Root Length [mm] Winter

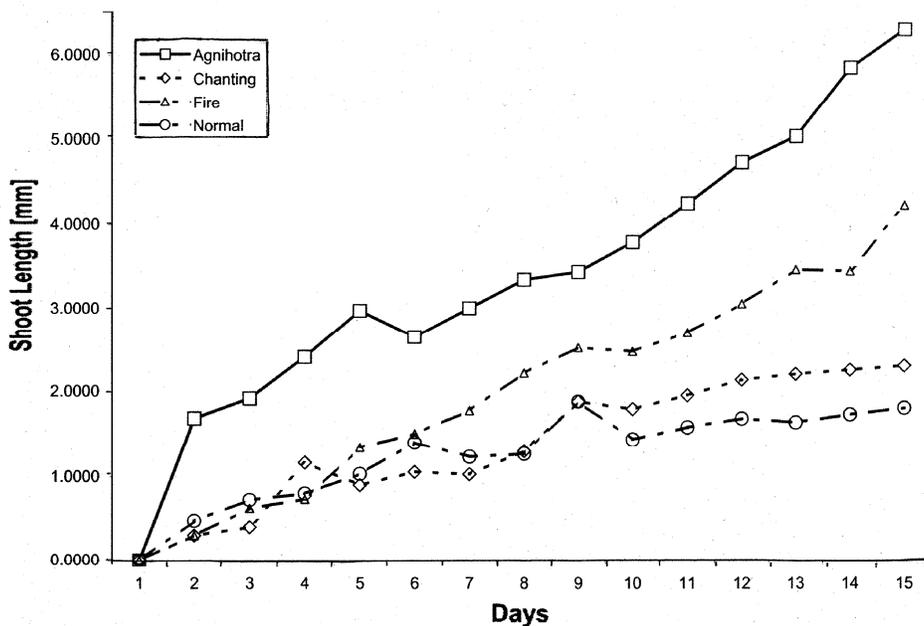


Fig.2 : Shoot Length [mm] Winter

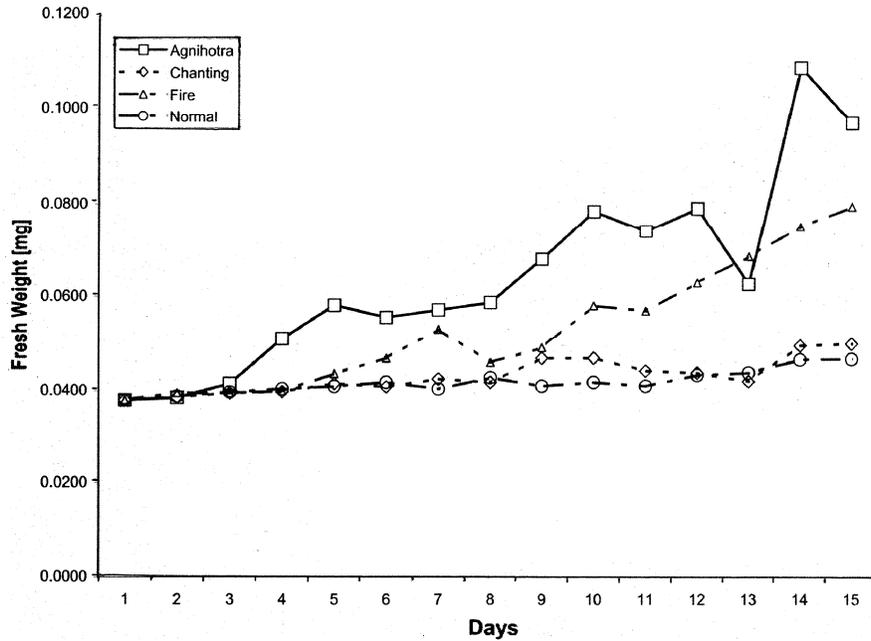


Fig.3 : Fresh weight [mg] Winter

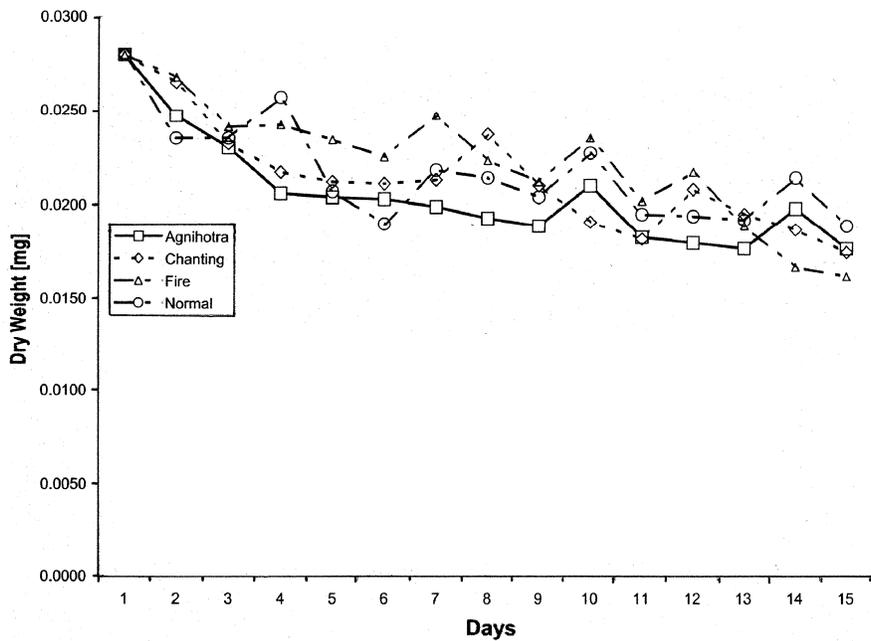


Fig.4 Dry Weight [mg] Winter

adequate to influence the growth rate. Combined with Agnihotra *mantra* chanting this effect increased several fold. This indicates that the effects of *mantra* chanting and fire are not merely additive but interactive. Their combined effect is far more than a simple addition of their individual effects.

For fresh weight, the trend was the same as in the previous cases, except for one anomalous value on the 12th day. Agnihotra fire and chanting showed a predominantly better performance than the cases with only fire, only chanting or with neither (Fig. 3).

The dry weight is measured after the seedlings are heated for a certain fixed period of time and at a fixed temperature (Fig. 4). This has the effect of removing the moisture content in the seedlings. This figure shows the same trend for all the four situations, indicating that the effect of Agnihotra, of chanting or of fire is basically to increase the moisture absorption of the seedlings. The decrease in dry weight over the 15 days showed the same trend for all the four cases as observed in earlier experiment⁶.

The data for all the three sets were subjected to statistical analysis, following the standard SPSS package. The analysis was done for the combined data for all the sets put together and then for the data of each individual set. For all cases, ANOVA and Post-hoc tests were done. The analysis showed that in the case of all data put together, which evens out seasonal variations, the shoot length and fresh weight showed a significant influence of Agnihotra on the germination as compared to the individual situations. However, for

the root length, the significance was a little less.

Data for sets 1 and 2 showed greater significant effect of Agnihotra compared to set 3, based upon Post-hoc tests, as well as multiple comparisons. In set 1, the significance was higher only for shoot length and fresh weight and not for root length. The data for dry weight did not show any significance for any set for the reasons given above.

The data for set 2, however, showed significance for root length, shoot length and fresh weight. Data for set 2 showed the greatest significance compared to the data of the other two sets.

Discussion

There are several likely reasons for the beneficial influence of Agnihotra. It is known from ancient texts that the materials used in Agnihotra sacrifice contain certain chemicals, which are released to the atmosphere during combustion. This has the effect of purifying the environment by eliminating harmful pollutants.

It is seen from our experiments that Agnihotra influences seed germination from the very first day itself. Germination involves a series of steps prior to the emergence of the radicle from the seed coat. The seed appears to rely on carbohydrates as the respiratory substrate. Respiration increases almost immediately upon imbibition and continues to increase with the growth of the seed. It is very likely that the Agnihotra-treated seeds have a higher rate of increase of respiration.

Except dry weight, all other parameters i.e., fresh weight, root length and shoot

length were significantly influenced by Agnihotra sacrifice during the germination process. In some cases, the influence was predominant; in some it was noticeable and in some others it was only marginal.

The analysis reveals that:

- 1 The most noticeable effect of Agnihotra is observed in set 2, which refers to winter.
- 2 The least significant effect is observed in set 3, which refers to summer.
- 3 The data for autumn in set 1 lie between those of set 2 and set 3, so far as significance is concerned.
- 4 The combined data for all the sets show a predominant influence of Agnihotra on fresh weight and shoot length.

As mentioned above, the sowing season in Karnataka, where the experiments were conducted, is usually the summer season and winter is the reaping season. There is hardly any sowing done of rice in winter. By autumn, the crops are well developing and do not need much water.

The data for set 3 taken for summer indicate only marginal variations among the four situations, with Agnihotra indicating a marginally higher value. But in set 2, referring to winter, the data for Agnihotra showed a predominantly higher influence. Visual observation of the seedlings showed stunted growth in the control, with only marginally higher values in the other two situations, as winter is not a conducive time for the germination of rice seeds. However, the predominantly higher values for the case of Agnihotra, confirmed by visual observations

also, lead to the conclusion that even in such unfavourable or marginally favourable conditions, Agnihotra can accelerate the germination process. This conclusion of ours is to some extent substantiated by the data for set 1 for autumn, which in their significance lie almost midway between the other two sets.

Conclusions

Agnihotra *mantra* along with the use of sacrificial fire as prescribed by Vedic injunctions accelerated the rate of growth of rice seedlings. Even in adverse circumstances, when the natural germination of rice seeds is slow, Agnihotra demonstrated its efficacy in accelerating germination.

There is a lot of scope for further work, which needs to be investigated in greater detail. In the above experiment male reciters were used in the room while the sacrifice was being done. Do the results vary if female voices or recorded voices are used? Many such questions need to be answered through further research work.

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References

- 1 Selvamurthy W, Physiological effects of *Mantra* on mind and body, Yoga Conference, Delhi, November 1989.
- 2 Goleccha G R, Agnihotra — a useful adjunct in treatment of a resistant and demotivated smack addict, *Indian J Psychiatry*, 29 (1987) 247.
- 3 Mondkar A G, The therapeutic effect of agnihotra ash on scabies of rabbits, *US Satsang*, 9(20) (1982).
- 4 Mondkar A G, Agnihotra effect on aerial microflora, *US Satsang*, 10(9) (1982).
- 5 Rao D V K & Tiwari R S, The effect of Agnihotra ash on the growth of pathogenic microflora, *US Satsang*, 15(3) (1987).
- 6 Matela Leszek, Effectiveness of Agnihotra on soil radioactivity, *US Satsang*, 15(20) (1988).
- 7 Jina Devi Heisnam, Concept of *Mantra* and its corresponding qualities, MS Dissertation, Hindu University of America, Orlando, Florida, U.S.A., January 2003.
- 8 Potdar M M, Agnihotra for equilibrium of nature and enhancement of human life, 2nd Edition, (Institute for Studies in Vedic Sciences, Akkalkot), 1993.
- 9 Deshpande M & Potdar M M, Agnihotra — a process for purification of the atmosphere: a Scientific Perspective, 3rd Edition, (Institute for Vedic Studies, Akkalkot), 1998.
- 10 Rajimvale S G, Agricultural farming method — an adjunct to ecological farming practices, 2nd Edition, (Institute for Vedic Studies, Akkalkot), 1999.
- 11 Mishra R, Impact of Agnihotra in crop production, *US Satsang*, 15(4-5) (1987).
- 12 Dave J J, Studies on the effect of Agnihotra on the germination of rice seeds, MBYR (Membership of the Board of Yoga Researchers) Dissertation, Vivekananda Yoga Research Foundation, Bangalore, India, 1997.
- 13 Jina Devi Heisnam, Effect of Agnihotra on the germination of rice seeds, MBYR (Membership of the Board of Yoga Researchers) Dissertation, Vivekananda Yoga Research Foundation, Bangalore, India, 2002.