

EFFECT OF HOMA ASH ON MUSTARD SEEDS (*BRASSICA JUNCEA*)

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ABSTRACT:

Homa Ash, Also considered as bottom ash contains many nutrients, which are essential for plant growth. To supplement this, pot culture experiment was conducted to evaluate the effect of homa ash incorporation in soil on germination and growth of mustard seeds (*brassica juncea*) during the winter season (January 2014). Germination plays a crucial role in deciding subsequent growth and productivity of the plant, minor addition of some supplement may give positive effect on the same. Hence, measured quantity of ash was added during seed sowing and germination time was recorded followed by second application just before flowering which was observed with control set without homa ash application. Results showed significant and positive effects of application of homa ash with respect to Germination time and plant height, as it enhanced the seed germination as well as plant growth rate remarkably with germination of 77% as compared to 35% in control. As the materials used during homa are natural and easily available, and, the ash left behind is nonpolluting and harmonious to the environment; this practice can be implemented on a larger scale to achieve the goal of sustainable agriculture.

Key words – Homa ash, germination, plant growth, sustainable agriculture

Oilseeds play a crucial role in Indian agricultural economy forming second largest agricultural service after cereals. Out of which, Indian mustard (*B. juncea*) is the major oil seed crop (about 90%) of rapeseed mustard group of crops in India.(Pandey, Kabdal, & Tripathi, 2013) It is a Perennial herb, usually grown as an annual or biennial, up to 1 m or more tall; branches long, erect or patent; lower leaves petioled, green, sometimes with a whitish bloom, ovate to obovate, variously lobed with toothed, scalloped or frilled edges, lyrate-pinnatisect, with 1–2 lobes or leaflets on each side.(Mishra, Dash, Murthy, Siddique, & Kushwaha, 2012) Mustard seeds

generally take three to ten days to germinate if placed under the proper conditions, which include a cold atmosphere and relatively moist soil. If additional supplements are provided, it may improve the quality and quantity of *brassica* production.

Germination and flowering are prime plant processes, which play a major role in deciding subsequent growth and yield, and so need to be evaluated with ash inclusions. Many experiments have been carried out to study the affect of fly ash or wood ash on seed germination and plant growth. (Kalra, Joshi, Chaudhary, Chaudhary, & Sharma, 1997) (Singh, Kulshreshtha, & Ahmad, 1997) (Agarwal, Singh, & Bhatt, 2004). These studies have shown beneficial impacts of ash on plant growth. Present study is carried out to study the effect of Homa ash on germination of *Brassica juncea*. As per the separate studies carried out on Soybean crop (Namrata, 2010), zea mays (Sharma, sengupta, sunar, & berk, 2012), mushroom cultivation (Indira, Dhasarathan, & Anandadevi, 2010), it has been observed that homa ash has a strong potential for increasing the yield and quality in plant production. Homa ash unlike fly ash contains all plant and Cow products which are environment friendly and biodegradable whose effect was observed on mustard seed.

Materials and methods

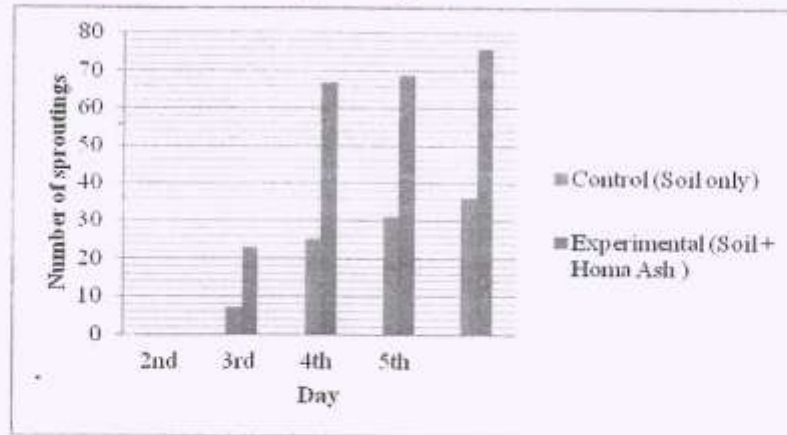
To study the effect of Homa ash, mustard seeds were planted in two sets of which one was kept as Control (Only soil and seeds) and other as Experimental (Soil with homa ash and seeds). For all pots from both the sets, fixed volume of soil was taken, to avoid the dissimilarity between control and experimental. Both the sets were given similar conditions of light, water (quantity) and temperature from day zero itself.

The small seeds of mustard need to be sown ideally not more than 2-3 cm into well prepared, moist seedbeds. Hence, good seed-soil contact was maintained to ensure uniform establishment. Application of homa ash in experimental set was followed at the time of sowing and just before flowering. To study the difference between control and experimental, germination time, viability of seeds, height of plant and growth rate were assessed on regular intervals from the day zero.

Result and discussion

Germination took place on 2nd day with significant difference in terms of numbers in both the sets. Numbers of sprouting as well as seed viability were more in soil with homa ash.

Graph 1: showing number of sprouting in both the sets from 2nd day till 5th day

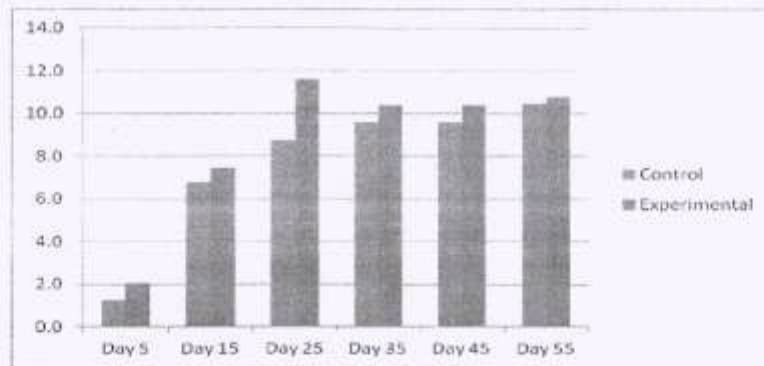


Records of plant heights in each pot of both sets were recorded on regular intervals of 5th, 15th, 25th, 35th days till pod formation that is till 65 days.

Table 1: Comparison between plant height and growth rate

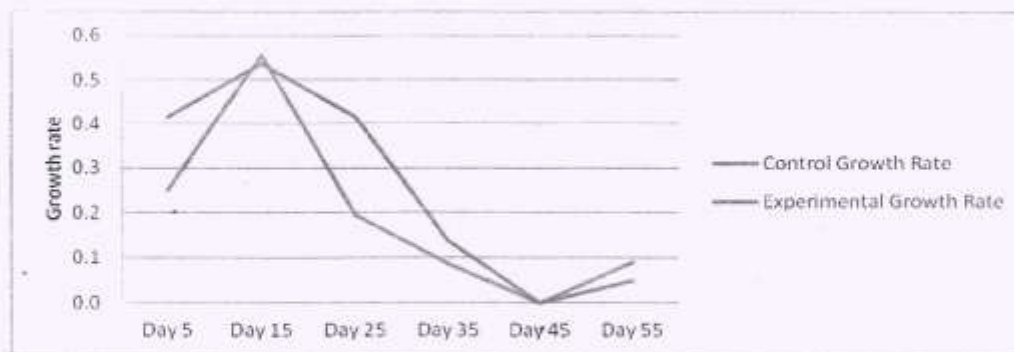
	Average height		Growth rate	
	Control	Experimental	Control	Experimental
Day 5	1.3	2.08	0.3	0.4
Day 15	6.8	7.46	0.6	0.5
Day 25	8.7	11.62	0.2	0.4
Day 35	9.6	10.4	0.1	0.1
Day 45	9.6	10.4	0.0	0.0
Day 55	10.5	10.78	0.1	0.0

Graph 2: showing plant heights in control and experimental set



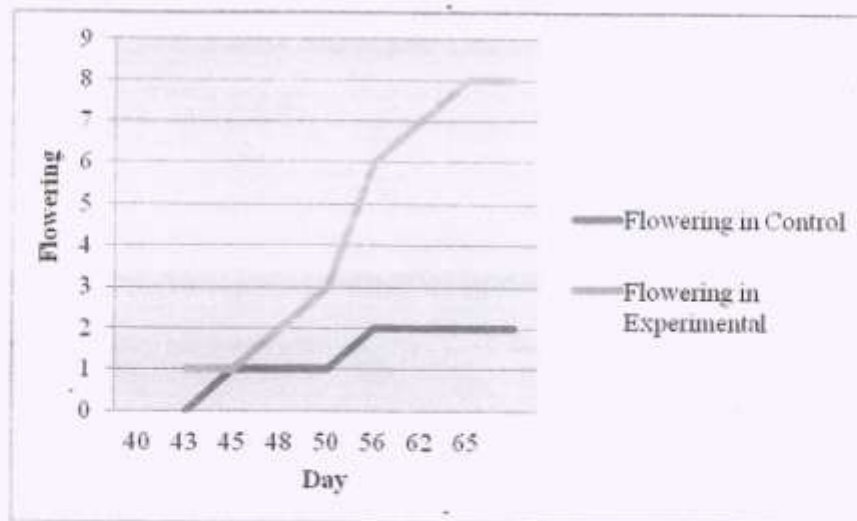
Along with heights, growth rate was also observed between day's intervals and compared. Homa ash applied soil contributed to larger growth rate as compared to control. Fluctuations in growth rate were more in control and it slowed down after 45 days. After which plant was showing very little change in growth pattern.

Graph 3: showing growth rates of control and experimental set



Within 35 to 40 days of germination, it began to bud. And first flowering was observed in experimental set (Soil with homa ash) on 37th day from germination followed by control on 41st day. The flowering period lasts around seven to 15 days, sometimes more. Pods developed from the flowers on 62nd day.

Graph 4: showing number of flowers across number of days



Apart from effects on seed germination and growth, Water percolation capacity was observed to be more in experimental pots than control. This indicates, lesser water quantity is sufficient if soil is supplemented with homa ash.

Conclusion

Application of homa ash has shown significant and quantifiable results with respect to germination, viability and growth rate. As the materials used in homa ash are cheap, easily available and harmonious to environment, it will be beneficial to use homa ash for improvement in crop production. But, this study needs to be replicated for larger sample, considering more parameters to analyze to confirm the results obtained in present study.

Acknowledgment

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