



**Efficacy of eco-friendly non-toxic indigenous organic preparation on germination ability, seedling length, seedling vigour, field emergence and seed mycoflora of Redgram (*Cajanus cajan* L.)**

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**ABSTRACT:**

Quality of seeds is very important for any crop to grow better in the future and to give higher yield and also to grow vigorously. These could also be enhanced by treating with many poisonous chemicals and growth factors. But these are always hazardous to human being, animals, microorganisms, environment and natural habitats. There are some facts like, if the crops are grown under the indigenous organic preparation, cultivation are less prone to diseases attack and safe to health. In the view of the above facts, the present study was conducted to evaluate the effect of different organic preparation which were indigenously prepared on seed quality parameters of redgram viz., germination percentage, length of plumule, length of radicals, seedling dry weight, seedling vigour, field emergence percentage of mycoflora. The results revealed that the seeds soaked in Brahamastra showed significantly highest germination percentage, length of plumule, length of radicals, seedling dry weight, seedling vigour, field emergence percentage and lesser invasion of mycoflora followed by Beejamrutha, Panchgavya and Jeevamrutha. The control which was soaking in water recorded significantly lowest seed quality parameters and highest invasion of mycoflora.

**Keywords:** Germination percentage, Length of plumule, Length of radicals, Seedling dry weight, Seedling vigour, Field emergence percentage, redgram.

**INTRODUCTION:**

Pulse crop are major source of oil, protein, minerals and vitamins and forms important part of predominantly vegetarian diet of Indian people. Among all grain legumes redgram is the most important kharif crop as it is most suitable for intercropping system. The modern agriculture depends more on chemicals which cause several environmental concerns as well as hazardous to human beings, livestock. Such concerns and problems posed by modern





agriculture paved with the way of rebirth to organic farming . Moreover since behind organic farming is to cultivate crops with environmental harmony, enhance soil fertility, promote soil biota, manage pests, diseases and weeds in eco-friendly manner and promote livestock and human health. In view of the above facts, the present investigation was therefore initiate to study the efficacy of indigenous organic preparation on germinability, seedling length seedling vigour, field emergence and mycoflora of redgram.

### **MATERIAL AND METHOD:**

The laboratory and field experiments were carried out during 2012 in Department of Agricultural Botany, College of Agriculture, Nagpur. Seeds of redgram were treated with four organic preparation viz. Brahmastra, Beejamrutha, Panchgavya and Jeevamrutha. The efficacy was compared with control (water) by studying germinability, seedling length, seedling vigour, field emergence and seed mycoflora.

#### **Methodology of Beejamrutha preparation**

Cow dung (50 g) was taken in cotton cloth and tied firmly and clipped in a glass beaker 1 litre of water overnight. Meanwhile lime solution was prepared by dissolving 1.2 g in 25 ml of water. next day morning, lime solution and 125 ml of cow urine were poured in to the glass beaker. Mixture was stirred well for proper mixing and solution is applied to soybean seeds. (Swamy, 2006a).

#### **Methodology of Jeevamrutha preparation**

This organic preparation was made by mixing 250 g cowdung, 250 ml cow urine , 50 g jiggery, 50 g gram flour, 2g farm soil mixed well with 5litre water in a plastic barrel. Barrel was kept in shade for one week undisturbed. It was stirred in anticlockwise direction daily twice and solution is applied to soybean seeds. (Swamy, 2006b).





### **Methodology of Panchagavya preparation**

This organic preparation was made by mixing 50 ml cow milk, 50 ml curd, 25 ml ghee, 70 ml cow urine and 125 ml fresh dung slurry in wide mouthed vessel and was kept in shady place. The solution was stirred every day, 50 g gram flour, 2g farm soil mixed well everyday during morning and evening. The panchagavya solution was ready on ninth day and it was applied to soybean seeds. (Swamy, 2006c).

### **Methodology Brahmastra preparation**

This organic preparation made by mixing 100 ml cow urine, 30 g cow dung, 30g neem leaves, 20 g castor leaves, 20 g lakki (kalatropis sp.) leaves, 20 g custard apple leaves, 20 g parthnium leaves, 10g pongamia and 10 g bitter gourd in 2 litre of water in a container. After this contents in this container were boiled and were kept for 30 days for fermentation. After filtration, the solution was used to apply to soybean seeds.

The above four solution (treatment) were used to soak redgram seeds for 5 minutes and were followed two minutes shade drying and about 100 seeds were used to inculcate in blotting paper for all the solution treatments separately in four replication for determining seed germinability percentage (germination percent). The germination percentage was evaluated on the value for percent normal seedling (Anonymous, 1985). The seedling vigour index was worked out following the method of Abdul- Baki and Anderson (1973). The fungal flora of the redgram seeds were detected by the standard moist blotter and agar medium techniques as prescribed by international rules for seed testing (Anonymous, 1985). The different type of fungal growth on the seed were expressed in percentage.

### **RESULTS AND DISCUSSION:**

Data presented in the Table 1 showed that brahmastra was significantly superior over other treatments, where 85% germination was observed and recorded highest seedling vigour index (3570) followed by Jeevamrutha with 81% germination and seedling vigour index (3159). Panchgavya recorded







germination 77% with seedling vigour index (2772) followed by Beejamrutha which recorded 73% germination with (2190). The control seed which only plain water application recorded lowest germination of 71% with seedling vigour index of (1917). It is clear from the present investigation that the seeds of Brahmastra treatment was found to be significantly superior with 85% and seedling vigour index 3570 than Jeevamrutha, Panchgavya, Beejamrutha and control. This must be due to Brahmastra solution which contain plant and animal products having anti-pathogenic properties. It protects the redgram seeds from seed born pathogens which could affect them during the germination processes. Cow dung and cow urine would provide the nutrition for seeds which could give good germination and seedling length. The similar results were also reported by Jahagirdar et al. (2001), Sugha (2005), Sumangala (2007), Shridhar et al. (2011) and Gadewar et al. (2013).

**Table 1: impact of organic preparation ( treatment on seed germination per cent, length of seedling (cm), seedling vigour index (svi) and field emergence (percent).**

Sr. No.	Treatments (Organic preparation)	Mean germination (Percent)	Mean length of seedling(cm)	Mean seedling vigour Index	Mean field emergence percent
1	Beejamrutha	73	30	2190	63
2	Jeevamrutha	81	39	3159	71
3	panchgavya	77	36	2772	66
4	Brahmastra	85	42	3570	77
5	Control	71	27	1917	61
	SE ±	0.94	0.21	-----	0.99
	CD at 1%	3.81	0.84	-----	4.00

Field emergence confirmed the superiority of Brahmastra (77 percent) over the Jeevamrutha (71 percent), Panchgavhya (66 percent), Beejamrutha (63 percent) and Control (61 percent). This might be due to the high seedling vigour





index. Bhardwaj (1995) and Bansal (2011) reported that animal waste product improve the soil physical conditions and environmental quality as well as provides nutrient for plants.

It might be seen from Table 2 that species of *Alternaria*, *Aspergillus*, *Cladosporium*, *Curvularia*, *Fusarium*, *Penicillium* and *Rhizopus* were isolated from the seeds of redgram. The incidence percentage of isolated fungal flora was higher in control. The Brahmastra treatment provided much protection to redgram seeds in preventing the development of fungal colonies both quantitative and specieswise as compared to Panchgavya, Jeevamrutha and Beejamrutha treatments. This might be due to anti-pathogenic properties of plant and animal products of brahmastra. The results obtained were in conformity with the findings of Bhaskara (1994), Jahagirdar et al. (2001), Sumangala (2007), Mane et al. (2001), Gadewar et al.(2013)

**Table-2: Impact of organic preparation on incidence percentage of microflora on redgram seeds.**

Sr. No.	Treatments (organic Preperation)	Percentage of fungi encountered on soybean seeds													
		A		B		C		D		E		F		G	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2
1	Beejamrutha	2	30	4	28	6	22	3	30	3	29	4	39	2	19
2	Jeevamrutha	2	21	4	30	3	28	1	10	2	21	2	25	1	6
3	Panchgavya	2	19	5	39	2	22	2	18	2	23	3	26	2	14
4	Brahmastra	1	4	2	8	1	4	1	6	1	4	2	12	1	6
5	Control	5	36	14	64	4	33	5	42	6	35	7	57	3	27

A: *Alterneria sp*; B: *Aspergillus sp*; C: *Cladosporium sp*; D: *Curvularia sp*; E: *Fusarium sp*; F: *Penicillium sp*; G: *Rhizopus sp*; 1: Standard blotter paper method; 2: Agar plate method.





## **CONCLUSION:**

Thus from the present study, it can be concluded that seeds of redgram should be treated (soaked) with Brahmastra solution before sowing. Because this treatment showed significantly maximum germination percent, length of seedling, seedling vigour index, field emergence percent and minimum invasion of fungal flora on the redgram seeds.

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