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Review Article

Efficacy of an Organic Formulation: Bijamrutham [Liquid Gold] on Seeds of Green Gram

Poonam Sethi^{*1}, Ramya V², Mahalakshmi S²

¹Assistant Professor, Department of Plant Biology and Plant Biotechnology, Guru Nanak College, Chennai, Tamil Nadu, India.

²Scholar, Department of Plant Biology and Plant Biotechnology, Guru Nanak College, Chennai, Tamil Nadu, India.

***Corresponding Author:** Poonam Sethi, Assistant Professor, Department of Plant Biology and Plant Biotechnology, Guru Nanak College, Chennai, Tamil Nadu, India.

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Abstract

The green gram sprouts were subjected to bijamrutham formulation and results demonstrated that, at a concentration of 100 µl showed promising effects, comparable to the commonly used Bordeaux mixture 10%. Furthermore, the organic spray also exhibited potential as a soil restorative agent, offering a sustainable alternative to chemical fertilizers with respect to seed vigour as calculated before and after treatment of bourdaeux mixture. Recommended for certain pulses and other vegetable crops controls disease and enhances seed growth hence a promising organic fertilizer. Zero Budget Natural Farming (ZBNF), is the need of the hour where only natural resources are used as fertilizers for multiple cropping systems recently practiced by thousands of farmers in India. However, without any scientific proof, this traditional and ancient technique is mocked as a bugged theory in the scientific community. In the current study, we have investigated the effect of Beejamrutham formulation—on seed vigour with analysis and the economics of ZBNF.

Keywords: Bijamrutham, Bordeaux mixture, Green gram, Chemical spray, Sprouts.

Introduction

Medicinal plants are applied in the treatment of various plant diseases in India. The concepts of organic agriculture were developed in the early 1900s by Sir Albert Howard, F.H. King and Rudolf Steiner who believed that the use of animal manures (often made into compost), cover crops, crop rotation, and biologically based pest controls resulted in a better farming system.

Howard, having worked in India as an agricultural researcher, gained much inspiration from the traditional and sustainable farming practices he encountered there and advocated for their adoption in the West [1]

Liquid organic formulations like bijamrutham prepared by fermentation process from the locally available ingredients are rich sources of beneficial microflora which gives support and helps in stimulating plant growth and better vegetative growth by producing good quality yield. [2]

This liquid gold is prepared from cow dung and cow urine

and used for seed treatment

before the process of sowing the seeds. It shows 100% better results when it is used on the day of preparation Sprouts of green gram (*Phaseolus radiatus*) an interesting and nutritious food. They have been used by the Chinese for centuries, and they are now widely accepted in our diet. The possibilities of enhancing their nutritional qualities through plant breeding are great.

The study explored the efficacy of Bijamrutham an organic preparation derived from cow dung, cow urine and jaggery a solution in which the seeds were soaked. The results demonstrated that at a concentration of 100 µl showed promising effects, comparable to the commonly used Bordeaux mixture 10%. Furthermore, the organic spray also exhibited potential as a soil restorative agent, offering a sustainable alternative to chemical fertilizers. These findings highlight the importance of exploring organic solutions in agriculture

and point towards the potential of organic fertilizer in improving tea plant health and yield while reducing the reliance on chemical controls.

Materials and Method

Method of preparation of Bijamrutham [3]

1. 3 kg Indian cow dung is taken in a piece of cloth and sealed it by rope-pouch like
 2. This sealed cloth is hung in the 10-litre water for 12 hours.
 3. 30 gm lime is added to water - for 12 hours.
 4. The sealed pouch is squeezed and the cow dung is allowed to accumulate in that water.
 5. 1 kg of farm soil is added to the solution and stirred well.
 6. Ferment with 3-liter Indian cow urine
 7. Soak the seeds in this solution and then sow it
 8. Applied in the early mornings for promising results
- The ingredients are mixed as per the requirement Table 1

Serial Number	Ingredient	Quantity
1	Cow Dung	3 kilograms
2	Cow Urine	3 Litres
3	Farm Soil	1 gram
4	Lime	30gram
5	Water	10 litres

Table 1: Ingredients of Beejamrutham

This liquid gold rich in microbes hastens the natural functions of the soil there by increasing the growth rate of plants and their yield.. These microbes disintegrate the wastes in the soil there by making soil more fertile. Mainly used for treating seeds and also effective in young roots protection.

Serial Number	Concentrations of Bijamrutham formulation μ l	Sprouting percentage %		Average Sprout length cm		Bordeaux 10% on Average Sprouting percentage		Bordeaux 10% on Average Sprout length cm	
		3 days	6 days	3 days	6 days	3 days	6 days	3 days	6 days
1	2	55	66	4.02	17.02	50	69	5.5	18.2
2	5	75	85	6.50	19.33	72	88	5.6	18.8
3	10	91	89	10.00	19.55	72	88	5.8	19.1
4	15	91	90	10.20	19.79	82	91	5.9	19.5
5	20	92	100	10.50	20.01	85	98	5.9	19.8
6	25	96	100	10.75	20.08	85	99	6.0	19.9

Table 2: Effect of Bijamrutham Formulation on Sprouting and Shoot Length Of Green Gram

Experimental plant: Green Gram

The wild variety was procured from TNAU (Tamil Nadu Agriculture University), Coimbatore.



Figure 1: Green Gram Seeds Used as Pulse

Calculation of Seed Vigor Index (Svi)

Seed Vigor Index (SVI) was determined by following Williamson and Richardson formula (1988) [4]

Seed Vigor Index (SVI) = Germination percentage X Seedling Length (Root+Shoot) / 100 Root, Shoot and Seedling Length

The normal seedlings were selected by random selection method after seven days of germination. The root, shoot length and total seedling length was measured and mean length was calculated after the application of Beejamrutham for 3 and 6 days interval. Bordeaux mixture 10% was the positive control [5]as widely applied by farmers of southern parts of India.

Results

The results demonstrated that bijamrutham, at a concentration of 100 μ l showed promising effects, comparable to the commonly used Bordeaux mixture 10%. as a positive control. [Table 2].

These findings highlight the importance of exploring organic solutions in agriculture and point towards the potential of organic fertilizers in improving tea plant health and yield while reducing the reliance on chemical controls (Figure 2 and 3).



Figure 2: Preparation of Bijamrutham Formulation



Figure 3: Effect of Bijamrutham Formulation on Green Gram Sprouts

Seed vigour index was calculated and tabulated to prove the efficacy of the formulation on the various growth parameters of the pulse widely used as a sprout.

Serial Number	Concentrations of Bijamrutham formulation μ l	Vigour Index for 3 days	Vigour Index for 6 days	Vigour Index Bordeaux 10% for 3 days	Vigour Index Bordeaux 10% for 6days
1	2	2.21	11.23	2.75	12.55
2	5	4.57	16.43	4.03	16.54
3	10	9.10	17.39	4.17	16.80
4	15	9.28	17.81	4.83	17.74
5	20	9.66	20.01	5.01	19.40
6	25	10.32	20.08	5.10	19.70

Table 3: Seed Vigour Index of Bijamrutham Formulation on Sprouting of Green Gram

Discussion

Using bijamrutum a traditional formulation used widely in southern parts of India for pulses one of the Traditional knowledge of ancient India. In earlier experiments it was proved that organic manures contain essential required nutrients which result in increased crop growth and yield [6] Very few references are available about scientific study of effect of cow dung on seed germination of important legume crops. *Arachis hypogaea* L. (Ground nut), *Glycine max* (L.) Merr. (Soybean), and *Vigna radiata*. (L.) R. Wilczek. (Green gram) economically used for production of oil and pulses and are integral part as food in Maharashtra. This experiment was

carried out to evaluate effectiveness of organic liquid treatments including Bijamrita on seed germination and seedling growth of these legume crops.[7]

Nitrogen fixers bacteria and actinomycetes help in mobilising more plant nutrients and required plant growth promoting substances and other micro nutrients are made available to the plants [8]. Many environmental groups and governments have demanded decrease of inorganic fertilizer use in agriculture to diminish nutrient leaching into ground water or water pollution[9]. Similarly instead of applying chemical treatments to seeds organic liquid treatments must be advocated [10,11] and [12].

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