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Studies on organic inputs (Jeevamruth and Beejamruth) and their efficacy on fenugreek

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Abstract

The present study on 'Biochemical evaluation of organic inputs (Jeevamruth and Beejamruth) and their efficacy on Greens' was carried out at the Department of sustainable organic agriculture, Tamil Nadu Agricultural University, Coimbatore during January 2016 to February 2016. A field experiment was conducted in a randomized block design with three replications. Biometric observations were taken during 10th, 20th and 30th days after sowing. Soil samples were collected during initial and at the stage of harvest and analysed for chemical and biological properties. Plant samples were analysed for protein and chlorophyll contents. From the results, the plant height, root length and single plant weight are high in the treatment T₃ (Jeevamruth 5% spray). From the results, the application of Jeevamruth and Beejamruth as a 5% spray was observed as a viable organic approach to improve soil and eco-friendly fenugreek production.

Keywords: Jeevamruth, beejamruth, biochemical evaluation, organic inputs

Introduction

With the growing awareness for safe and healthy food, the demand for organic food is increasing. Concern for deteriorating soil health and increasing contamination in ground water and surface water bodies have also added to the need for alternative technologies which not only can ensure safe and healthy food but are also environment friendly, contribute to the long term fertility and sustainability of the soils. During the last 10 years, many farmers due to various reasons, have switched over to the organic methods of cultivation and are now successfully growing comparable productivities with much less costs. In the absence of any scientific support, majority of the farmers relied on the traditional wisdom. On-farm experimentation has developed innovative inputs which has to be prepared on-farm with local resources. Among these innovative inputs most common and successful inputs are Panchagavya, Jeevamruth and Vermiwash.

Nowadays organic farming practices are gaining importance as farmers have realized the benefits of organic farming in terms of soil fertility, soil health and sustainable productivity. Farmers are well aware with the use of organic liquid manure such as Panchagavya, Beejamruth and Jeevamruth as well as bio digester in organic farming. These organic liquid manures play a key role in promoting growth and providing immunity to plant system. The spray of Panchgavya on crop imparts dark green colour leaves within 10 days. Its role as plant growth promoter has already been reported by Subhashini *et al.*, (2001)^[8] and Sreenivasa *et al.*, (2010)^[7]. Though many farmers are getting better yield by using organic liquid manures, scientific validation has not been carried out.

Materials and methods

Field experimental details

The experiment was conducted in a randomised block design with three replications. The experimental layout was kept undisturbed throughout the period of investigation and fenugreek seeds were soaked for 1 hr in the Beejamruth solution before sowing and were sown in the field.

Design	RBD
Number of treatments	7
Number of replications	3

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Treatments

- T₁-Control
T₂-Jeevamruth @ 3% Spray (Green gram flour)
T₃-Jeevamruth @ 5% Spray (Green gram flour)
T₄-Jeevamruth @ 3% Spray (Black gram flour)
T₅-Jeevamruth @ 5% Spray (Black gram flour)
T₆-Jeevamruth @ 3% Spray (Green gram + Black gram flour)
T₇-Jeevamruth @ 5% Spray (Green gram + Black gram flour)

Field preparation and sowing

The field was thoroughly prepared to a fine tilth. The soil type of experimental plot was clay loam with a pH of 7.42. Seeds of fenugreek variety Co1 selection were sown in lines adopting a spacing of 30 × 15 cm at the rate of 40 grams per bed (size 2.0×2.0). Plants were thinned at 3 days after sowing.

Results and Discussion

Growth attributes

Plant height

From the observations taken in 10th days after sowing (DAS) in the fenugreek plants, the highest plant height of 9.63 cm was observed in T₃, which was significantly higher when compared to all other treatments. The plant height in T₅ and T₇ were on par and the lowest plant height was recorded in control (4.1 cm) T₁. The highest plant height of 0.9 cm was observed in T₃ at the 20th day after sowing, followed by T₇ (19.1 cm). T₃ and T₇ were on par with each other. Lowest plant height of 9 cm was recorded in T₁. The observations at 30 days after sowing reveals that the highest plant height of 28.99 cm was observed in T₃, followed by T₅ (25.89 cm) and T₇ (24.59 cm), which did not differ significantly among themselves. Lowest plant height of 14.70 cm was recorded in the treatment T₁ (Table 1). Plant heights referred as an index of plant growth was higher under T₃ treatment. Increase in plant height of fenugreek was due to the presence of higher amounts of major nutrients in Jeevamruth. This was relevant with the report that NPK influences the plant growth (Naidu *et al.* 1999) [2]. Subhashini Sridhar *et al.* (1999) [8] also reported that panchagavya had increased the growth of chillies. Increased plant height due to poultry manure and neem cake was reported by Obi and Ebo (1995) [3] and Ramakrishnan *et al.* (1997) [4], respectively.

Root length

From 10 DAS, the plant root length was maximum (3.10 cm) in T₇. The plant root length in T₃, T₄ and T₇ were on par and the lowest plant root length was recorded in control (2.00 cm) T₁. The greens root length was highest (8.00 cm) in T₃ at 20th day. The lowest root length was observed in control T₁ (3.5 cm) which was on par with T₆ (3.8 cm). Similar trend was observed with T₃ at 30 days after sowing (12.20 cm) followed by the treatments T₇ (10.4 cm), T₂ (7.50 cm) and T₄ (7.30 cm). The lowest root length was observed in T₆ (5.30 cm), followed by T₁ (5.50 cm) (Table 2). The highest root length and stem girth was observed in the T₃. These results are in line with Somasundaram (2003) [6], that stem girth and root length of sunflower, maize and green gram was increased due to the application of biogas slurry + panchagavya as nutrient source. Increase in stem girth of Moringa due to organic manure application was reported by Vijayakumar (2001) [1]. Increased, plant height and plant weight of fenugreek was observed in the treatment T₃. The nutrients in the available form, presence of nutrients near the root zone and easy transfer of nutrients to plants might have contributed for the increase in plant height and weight. Somasundaram (2003) [6] also reported a significant increase in the length of maize cobs when panchagavya was used as nutrient source.

Total biomass

The total biomass are recorded high in T₃ (916 gram) and the lower yield is 323 gram in T₁ (Table 3). There are several reasons for increased yield in fenugreek due to application of Jeevamruth. The quantities of growth regulators and beneficial microbes present in Jeevamruth could have created the stimuli in the plant system. This in turn could have potentiated the entire cell system for further natural production of growth regulators. Kalarani (1991) [1] reported that the action of the growth regulators in plant system stimulated the necessary growth and development in plants, leading to better yield. Selvaraj (2003) [5] also reported that the highest pod yield was recorded in French Bean var. Ooty 2 which received panchagavya as nutritional spray. The total NPK analysis revealed that it was found to be high in T₃ and T₇ treatments. The high intake of NPK in the above treatments was responsible for the increase in plant growth.

Table 1: Effect of organic nutrient source (Jeevamruth) on Fenugreek plant height (cm)

Treatments		Plant height (cm)		Rate of increase	
		10 DAS	20 DAS	30 DAS	10 -20 DAS
T ₁	Control	4.10	9.00	14.70	119.51
T ₂	Jeevamruth @ 3% Spray(Green gram)	5.30	11.20	16.30	111.32
T ₃	Jeevamruth @ 5% Spray(Green gram)	9.63	20.29	28.99	110.70
T ₄	Jeevamruth @ 3% Spray(Black gram)	6.90	15.00	22.79	117.39
T ₅	Jeevamruth @ 5% Spray(Black gram)	8.20	17.79	25.89	116.95
T ₆	Jeevamruth @ 3% Spray(Green gram + Black gram)	5.90	13.00	21.19	120.34
T ₇	Jeevamruth @ 5% Spray(Green gram + Black gram)	8.30	19.19	24.59	131.20
SED		0.0281	0.0387	0.049	
CD(P = 0.05)		0.0612	0.0843	0.1068	

Table 2: Effect of organic nutrient source Jeevamruth on fenugreek root length (cm)

	Treatments	Root length (cm)		
		10 DAS	20 DAS	30 DAS
T ₁	Control	2.00	3.50	5.50
T ₂	Jeevamruth @ 3% Spray(Green gram)	3.01	8.00	12.20
T ₃	Jeevamruth @ 5% Spray(Green gram)	2.70	7.30	10.40
T ₄	Jeevamruth @ 3% Spray(Black gram)	2.80	4.30	6.20
T ₅	Jeevamruth @ 5% Spray(Black gram)	3.00	5.40	7.30
T ₆	Jeevamruth @ 3% Spray (Green gram + Black gram)	3.10	6.20	7.50
T ₇	Jeevamruth @ 5% Spray (Green gram + Black gram)	2.20	3.80	5.30
	SED	0.0098	0.0173	0.0243
	CD(P = 0.05)	0.0843	0.0376	0.0529

Table 3: Effect of organic nutrient source (Jeevamruth) on Fenugreek plant biomass (g)

	Treatments	Total weight in (g)
T ₁	Control	323.33
T ₂	Jeevamruth @ 3% Spray(Green gram)	800.00
T ₃	Jeevamruth @ 5% Spray(Green gram)	916.67
T ₄	Jeevamruth @ 3% Spray(Black gram)	613.33
T ₅	Jeevamruth @ 5% Spray(Black gram)	840.00
T ₆	Jeevamruth @ 3% Spray (Green gram + Black gram)	853.33
T ₇	Jeevamruth @ 5% Spray (Green gram + Black gram)	760.00
	SED	136.2887
	CD(P = 0.05)	296.950

**Plate 1:** Experimental field view

Conclusions

From the field experiment conducted at Research Farm, Department of Sustainable Organic Agriculture, Tamil Nadu Agricultural University, Coimbatore to test the effect of Jeevamruth and Beejamruth on Fenugreek, it is inferred that, the plant height, root length and single plant weight are highest in the treatment T₃(Jeevamruth @ 5% spray).

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