Himachal Journal of Agricultural Research
Volume 51, Issue 2, December 2025; pp. 281–284; DOI: 10.18311/HJAR/2025/53862
INFORMATICS JOURNALS
Short Communication

Effect of Natural and Organic Nutrient Sources on Growth Parameters and Yield of Blackgram (*Vigna mungo* L.)

Shiwani Kumari[1*], Janardan Singh[2], Rameshwar Kumar[2], Pardeep Kumar[3], Sachin[1] and Sanjana Mali[1]

[1]Department of Agronomy, Chaudhary Sarvan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur – 176062, Himachal Pradesh, India; shiwani00032@gmail.com

[2]Department of Organic Agriculture and Natural Farming, Chaudhary Sarvan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur – 176062, Himachal Pradesh, India

[3]Department of Soil Science, Chaudhary Sarvan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur – 176062, Himachal Pradesh, India

Abstract

A field experiment was conducted during the rainy season in 2024 at the Integrated Research Farm, Department of Organic Agriculture and Natural Farming, Chaudhary Sarvan Kumar Himachal Pradesh Krishi Vishvavidyalaya (CSKHPKV), Palampur, to study the effect of different levels of *Ghanjeevamrit* and *Jeevamrit* on blackgram. The experiment comprised eight treatments with three replications, *viz.* T_1 – *Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (10 %), T_2 – *Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (15 %), T_3 – *Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (20 %), T_4 – *Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (10 %), T_5 – *Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (15 %), T_6 – *Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20 %), T_7 – Farm yard manure (10 t/ha) and T_8 – control. The experiment was laid out in a randomised block design. The experimental soil was silty clay loam and acidic (5.12) in reaction with EC (0.106 µS/m). The application of *Ghnjeevamrit* @ 10 q/ha + *Jeevamrit* @ 20 % recorded the maximum plant height, primary branches per plant, number of nodules per plant, dry matter accumulation per plant and yield. The lowest value of above said parameters was recorded in T_8 (control). T_6 recorded an 82 per cent increase in yield over the control. T_5 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (15 %)} and T_4 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (10 %)} were recorded as the second and third best treatments, respectively.

Keywords: Blackgram, *Ghanjeevamrit*, Growth, *Jeevamrit,* Yield

Agriculture has long been the backbone of India, feeding the population and employing the largest share of its workforce while contributing significantly to the national Gross Domestic Product (GDP). As an agrarian nation with a predominantly vegetarian population, pulses play a key role in meeting protein needs. Among them, blackgram (*Vigna mungo* L.), also known as urdbean, is a major pulse crop in South Asia and crucial for global food and nutritional security.

India is the largest producer and consumer of black gram, accounting for about 11% of its total pulse production. Its area, production and productivity stand at 3.54 million ha, 2.32 million tonnes and 656 kg/ha, respectively (Anonymous 2024a). In Himachal Pradesh, these figures are 0.06 million ha, 0.04 million tonnes and 719 kg/ha (Anonymous 2024b). Blackgram is rich in nutrients—26% protein, 60% carbohydrates and 1.3% fat—and contains significantly higher

*Author for correspondence

Manuscript received:13.08.2025; Accepted: 15.11.2025

phosphoric acid than other pulses. It is consumed widely as dal, and used in products like *papad* and *bari*, as well as in *Ayurvedic* medicine, cattle feed and green manuring. Its deep roots help prevent soil erosion, and its nitrogen-fixing ability enhances soil fertility.

Excessive use of chemical fertilisers has degraded soil health due to the build-up of salts in the rhizosphere (Chandel *et al.* 2023), human health, reduced crop quality and encouraged pests and diseases (Sharma *et al.* 2014; Sharma *et al.* 2016; Ahmed *et al.* 2017). In response, natural farming has emerged as a sustainable, eco-friendly alternative and has expanded popularity in recent years on account of chemical-free crop produce, income, health and reduced farm expenses (Noori *et al.* 2023). Originating from Masanobu Fukuoka's principles and introduced in India by Subhash Palekar, it promotes the use of indigenous inputs like *Jeevamrit*, *Ghanjeevamrit* and *Beejamrit* to support plant growth, boost yields, and improve soil health.

The experiment was carried out at the Integrated Research Farm of the Department of Organic Agriculture and Natural Farming, CSK HPKV, Palampur, during the rainy season of 2024. Palampur falls under the subtropical humid zone of Himachal Pradesh. It is characterised by warm summers and cool winters. During the crop growth season, mean weekly maximum and minimum temperatures ranged from 25.5°C to 29.5°C and 14.6°C to 19.7°C, respectively. A total of 2405mm of rainfall was recorded during the cropping season. The experimental soil was silty clay loam and acidic (5.12) in reaction with EC (0.106 µS/m), organic carbon (6.19 g/kg), available nitrogen (229.7 kg/ha), available phosphorus (18.2 kg/ha) and available potassium (221.7 kg/ha). The field experiment was laid out in a randomised block design with eight treatments. Treatments were replicated thrice and allocated randomly using a random number table. The treatments were: T_1– *Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (10%), T_2– *Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (15%), T_3– *Ghanjeevamrit* (5q/ha) + *Jeevamrit* (20%), T_4– *Ghanjeevamrit*(10 q/ha) + *Jeevamrit* (10%), T_5– *Ghanjeevamrit*(10 q/ha) + *Jeevamrit* (15%), T_6 *Ghanjeevamrit*(10 q/ha) + *Jeevamrit* (20%), T_7– Farm yard manure (10 t/ha) and T_8–Control. Him Mash – 1 was used for sowing @ 20 kg/ha. The spacing maintained was 30 × 10 cm. Seeds were treated with *Beejamrit* @ 200 ml/kg. *Ghanjeevamrit* was applied at the time of sowing, and *Jeevamrit* was applied first at emergence and subsequently at 14-day intervals. *Ghanjeevamrit* and *Jeevamrit* are prepared by mixing cow dung, cow urine, gram flour, jaggery and a handful of soil and fermenting it for 48 hours. Other recommended packages and practices of blackgram were also followed. The result of the various aspects was subjected to statistical analysis using analysis of variance as per the procedure suggested by Gomez and Gomez (1984).

Plant height at 30, 60 days after sowing and at harvest was significantly influenced by different treatments. Plant height showed an increasing trend with age, and the tallest plants were recorded at the time of harvest in all the treatments (Table 1). The tallest plant at all growth stages was recorded in T_6 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20 %)} while the shortest plant was recorded in T_8 (control). This might be due to improved soil physical properties and nutrient availability. *Ghanjeevamrit* and *Jeevamrit* are rich in beneficial soil microbes, which increase soil biological activity and improve nutrient mineralisation, increasing the availability of nutrients like nitrogen, phosphorus and micronutrients for plant uptake throughout the crop growth period. Similar results were reported by Choudhary (2023). The number of primary branches was significantly influenced by different treatments, with a higher number of branches recorded in T_6 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20 %)} followed by T_5 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (15%)}. Nasratullah *et al.* (2021) reported similar results in blackgram. It may be due to the synergistic effects of enhanced nutrient availability and stimulated microbial activity that improved plant metabolism, which supports vigorous vegetative growth and shoot proliferation. The nodule count was found to be highest in T_6 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20%)} and control recorded less number of nodules per plant, probably due to an increase in phytochromes, controlled nutrient release that stimulates rhizobial activity and nodules (Table 2). Treatment with farm yard manure (T_7) recorded comparatively lower nodule count, which may be due to lower microbial and hormonal stimulation (Chaudhary *et al.* 2022).

Different treatments significantly influenced dry matter accumulation at all growth stages. Treatment T_6 {(*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20%)} recorded

Table 1. Effect of treatments on plant height (cm) and dry matter accumulation(g/plant) of blackgram

	Treatment	Plant Height			Dry Matter Accumulation		
		30 DAS	60 DAS	At harvest	30 DAS	60 DAS	At harvest
T_1	*Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (10 %)	13.0	30.1	42.2	1.42	5.49	10.24
T_2	*Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (15 %)	12.8	30.5	41.5	1.43	6.05	10.42
T_3	*Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (20 %)	13.3	30.8	42.3	1.51	6.01	10.71
T_4	*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (10 %)	14.4	32.5	43.7	1.56	7.15	10.99
T_5	*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (15 %)	15.3	34.0	43.4	1.60	7.77	12.37
T_6	*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20 %)	16.4	36.1	44.7	1.71	8.39	13.00
T_7	Farm yard manure (10 t/ha)	14.0	32.1	43.2	1.56	7.58	10.92
T_8	Control	12.5	29.5	40.1	1.23	5.28	8.46
	SEm±	0.42	0.80	0.75	0.08	0.41	0.52
	CD (P=0.05)	1.27	2.42	2.26	0.23	1.24	1.57

Table 2. Effect of treatments on the number of primary branches per plant and number of nodules per plant

	Treatment	Primary Branches Per Plant	Number of Nodules Per Plant	Seed Yield (kg/ha)	Straw Yield (kg/ha)
T_1	*Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (10 %)	6	12	768	1615
T_2	*Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (15 %)	6	12	790	1679
T_3	*Ghanjeevamrit* (5 q/ha) + *Jeevamrit* (20 %)	6	13	812	1713
T_4	*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (10 %)	6	13	885	1877
T_5	*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (15 %)	7	13	903	1886
T_6	*Ghanjeevamrit* (10 q/ha) + *Jeevamrit* (20 %)	7	14	970	1964
T_7	Farm yard manure (10 t/ha)	6	13	860	1860
T_8	Control	5	10	532	1463
	SEm±	0.15	0.64	32.9	59.2
	CD (P=0.05)	0.47	1.94	99.7	179.6

the highest dry matter accumulation at 30, 60 days after sowing and at harvest. This might be because *Ghanjeevamrit* and *Jeevamrit* moderate soil moisture and temperature, preventing stress and enabling root shoot growth to fully utilise microbial and nutrient benefits, resulting in increased photosynthesis producing more biomass (Table 1). Natural Farming inputs support the nutrient requirement of the crop and production of a greater number of photosynthetically active leaves, which might have led to higher production of carbohydrates and phytohormones that resulted in higher dry matter production, branches and nodules (Kavitha *et al.* 2022).

The highest seed yield of 970 kg/ha and straw yield of 1964 kg/ha was recorded in T_6 (*Ghanjeevamrit* @ 10 q/ha + *Jeevamrit* 20%) (Table 2). This might be due to enhanced soil biological activity, nutrient availability and plant physiological efficiency. *Ghanjeevamrit* and *Jeevamrit* are rich in beneficial microorganisms, Plant Growth-Promoting Rhizobacteria (PGPR) and available nutrients, which contribute to a more nutrient-efficient and biologically active rhizosphere. This results in increased nutrient uptake by the plant, resulting in longer pods with a larger number of seeds. These findings are in close conformity with Yogananda *et al.* (2020). The combined application of *Ghanjeevamrit* and *Jeevamrit* provided for the nutritional needs of the crop, which resulted in the availability of nutrients throughout the crop growth that ultimately improved the growth and yield of blackgram.

CONCLUSION

On the basis of the findings, it could be concluded that *Ghanjeevamrit* @10 q/ha + *Jeevamrit* @ 20% at 14-day intervals is the best treatment improving growth and yield of the blackgram. These results suggest improved vegetative and reproductive growth primarily due to enhanced soil fertility, microbial activity and nutrient availability from the combined application of *Ghanjeevamrit* and *Jeevamrit*. The future research on *Ghanjeevamrit* and *Jeevamrit* should focus on how these natural inputs influence soil microbes, nutrient cycling and nitrogen fixation, while also developing standardised preparation and application methods. There is a need for long-term studies to evaluate their effects on soil fertility, yield, seed quality and disease resistance across crop species.

Conflict of Interest: Authors declare no competing interests.

REFERENCES

Anonymous 2024a. Season-wise area, production and productivity of urad in India. Ministry of Agriculture and Farmers Welfare, Government of India

Anonymous 2024b. State or Season-wise area, production and productivity of urad in India. Ministry of Agriculture and Farmers Welfare, Government of India

Ahmed N, Rameshwar, Saini, J.P., Sharma, R.P., Punam and Seth, M. (2017). Performance of chickpea under organic and inorganic sources of nutrients at different soil moisture regimes in chickpea-okra cropping system. Himachal Journal of Agricultural Research **43(1):** 23-28

Chandel A, Sharma A, Sharma P, Rana SS, Rana RS and Shilpa 2023. Seed yield, nutrient absorption and soil health as influenced by sowing time, fertility and genotypes of garden pea (*Pisum sativum* L.). Horticultural Science **50(2):** 142-151. https://doi.org/10.17221/138/2022-HORTSCI

Choudhary S 2023. Effect of biofortified Beejamrit and Jeevamrit on performance of blackgram (*Vigna mungo* L.). M.Sc. (Agri) Thesis p 41. Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Jammu, India

Choudhary R, Kumar R, Sharma GD, Sharma RP, Rana N and Dev P 2022. Effect of natural farming on yield performances, soil health and nutrient uptake in wheat + gram intercropping system in sub-temperate regions of Himachal Pradesh. Journal of Crop and Weed **18(2):** 01-08. https://doi.org/10.22271/09746315.2022.v18.i2.1566

Gomez KA and Gomez AA 1984. Statistical Procedure for Agricultural Research, 2nd edition. Wiley Inter Science, New York, USA. p 680

Kavitha R, Nagesh N, Gurumurthy SB, Basavaraja N, Manu KHR and Koujalagi CB 2022. Studies on effect of Ghanajeevamrit and liquid Jeevamrit on yield and yield attributes of banana cv. Ney Poovan. The Pharma Innovation Journal **11(9):** 826-832. https://doi.org/10.22271/tpi.2022.v11.i9i.15299

Nasratullah, Kumar R, Manuja S, Sharma RP, Sharma GD and Verma S 2021. Evaluation of different components of natural farming in black gram (*Vigna mungo* L.) under mid-hill conditions of Himachal Pradesh. Himachal Journal of Agricultural Research **47(2):** 175-179.

Noori R, Sharma A, Rana SS, Lata H, Sharma P and Rana RS 2023. Differential response of nutrient management practices on different varieties in chilli-garden pea cropping system. Himachal Journal of Agricultural Research **49(1):** 84-92.

Sharma A, Sharma RP and Singh S 2016. Influence of *Rhizobium inoculation*, split nitrogen applications and plant geometry on productivity of garden pea (*Pisum sativum* L.) in an acid alfisol. Legume Research **39(6):** 955-961. https://doi.org/10.18805/lr.v39i6.6642

Sharma A, Sharma RP, Sharma GD, Sankhyan NK and Sharma M 2014. Integrated nutrient supply system for cauliflower-french bean-okra cropping sequence in humid temperate zone of north-western Himalayas. Indian Journal of Horticulture **71(2):** 211-216.

Yogananda SB, Thimmegowda P and Shruthi GK 2020. Performance of cowpea [*Vigna unguiculata* (L.) Walp] under organic production system in southern dry zone of Karnataka. Legume Research- An International Journal **43(2):** 229-234. https://doi.org/10.18805/LR-4175