



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
© Agronomy
NAAS Rating (2026): 5.20
www.agronomyjournals.com
2026; 9(5): 268-270
Received: 11-02-2026
Accepted: 15-03-2026

Deependra Singh Sarangdevot
Ph.D. Research Scholar,
Department of Agronomy,
MPUAT, Udaipur, Rajasthan,
India

Roshan Choudhary
Associate Professor, Department of
Agronomy, SKNAU, Jobner,
Rajasthan, India

Renuka Bhakher
Ph.D. Research Scholar,
Department of Agronomy,
MPUAT, Udaipur, Rajasthan,
India

Shaifali Tanwar
Ph.D. Research Scholar,
Department of Horticulture,
MPUAT, Udaipur, Rajasthan,
India

Yuvraj Nath Chouhan
Ph.D. Research Scholar,
Department of GPB, MPUAT,
Udaipur, Rajasthan, India

Manish Kumar
Ph.D. Research Scholar,
Department of Agronomy,
MPUAT, Udaipur, Rajasthan,
India

Corresponding Author:
Deependra Singh Sarangdevot
Ph.D. Research Scholar,
Department of Agronomy,
MPUAT, Udaipur, Rajasthan,
India

Effect of pelleted vermicompost on yield and yield attributes of organic greengram (*Vigna radiata* L.)

Deependra Singh Sarangdevot, Roshan Choudhary, Renuka Bhakher, Shaifali Tanwar, Yuvraj Nath Chouhan and Manish Kumar

DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i5d.5513>

Abstract

A field experiment entitled “Effect of Pelleted Vermicompost on Yield and Yield Attributes of Organic Greengram (*Vigna radiata* L.)” was conducted during *kharif* 2022 at the Organic Farming Unit, Rajasthan College of Agriculture, MPUAT, Udaipur. The experiment was laid out in a factorial randomized block design with three replications, comprising 15 treatment combinations involving four levels of pelleted vermicompost (1, 2, 3 and 4 t ha⁻¹) along with control, and three scheduling treatments. Greengram variety GM-4 was sown at spacing of 30 cm × 10 cm using seed rate of 15 kg ha⁻¹.

The results revealed that application of pelleted vermicompost significantly enhanced yield attributes and yield of greengram. The highest number of pods per plant (21.92), seeds per pod (11.52) and seed weight per pod (0.53 g) were recorded under 4 t ha⁻¹ pelleted vermicompost. Correspondingly, maximum seed yield (1190 kg ha⁻¹), haulm yield (3038 kg ha⁻¹) and biological yield (4228 kg ha⁻¹) were also obtained under the same treatment. Among scheduling treatments, split application (50% at sowing + 25% at 4 WAS + 25% at 6 WAS) proved superior. The maximum net return (₹ 73,077 ha⁻¹) was recorded under 4 t ha⁻¹ pelleted vermicompost.

Thus, application of pelleted vermicompost at 4 t ha⁻¹ along with split scheduling is recommended for enhancing productivity and profitability of organic greengram.

Keywords: Greengram, pelleted vermicompost, yield, organic farming

Introduction

Greengram (*Vigna radiata* L.) is an important pulse crop cultivated during the *kharif* season and serves as a major source of dietary protein in India (Kumar and Ali, 2004) [3]. It also improves soil fertility through biological nitrogen fixation. However, productivity under organic farming systems is relatively low due to limited nutrient availability and poor nutrient synchronization. Globally, organic farming is practiced on about 76 million hectares of land (FiBL, 2021) [6], while in India about 9.11 million hectares are under organic cultivation (APEDA, 2023). Efficient nutrient management using organic inputs is therefore essential for improving productivity and sustainability.

Vermicompost is a rich source of macro- and micronutrients, enzymes and beneficial microorganisms, which improve soil physical, chemical and biological properties. Pelleting of vermicompost enhances its handling, storage and nutrient use efficiency by ensuring slow and sustained nutrient release (Hernandez *et al.*, 2006) [8]. However, information regarding optimum dose and scheduling of pelleted vermicompost in greengram is limited. Therefore, the present investigation was undertaken.

Materials and Methods

The experiment was conducted during *kharif* 2022 at the Organic Farming Unit, Instructional Agronomy Farm, Rajasthan College of Agriculture, MPUAT, Udaipur (24°35' N latitude and 73°42' E longitude, 581 m above mean sea level). The region falls under Agro-climatic Zone IVa (Sub-humid Southern Plain and Aravalli Hills).

The experiment was laid out in factorial randomized block design (FRBD) with three replications, comprising 15 treatment combinations involving four levels of pelleted

vermicompost (1, 2, 3 and 4 t ha⁻¹) along with control, and three scheduling treatments. The treatment combinations were randomized with the help of random number table (Fisher, 1950) [7] Greengram variety GM-4 was sown at spacing of 30 cm × 10 cm using seed rate of 15 kg ha⁻¹.

Preparation of vermicompost pellets

Well dried vermicompost is taken after proper sieving into a container and bentonite as binding agent, is thoroughly mixed and then taken into the pellet making machine which makes small cylindrical pellets. The cylindrical pellets are then placed in centrifugal machine which helps in transforming the cylindrical pellets into spherical pellets.

Results and Discussion

Yield Attributes

Application of pelleted vermicompost significantly influenced yield attributes. The highest number of pods per plant (21.92) was recorded under 4 t ha⁻¹, which showed an increase of 7.71, 7.93, 12.74 and 22.66 per cent over 3, 2, 1 t ha⁻¹ and control, respectively. Similarly, number of seeds per pod (11.52) increased by 8.94, 17.59, 27.36 and 39.88 per cent over respective treatments.

Weight of seed per pod was also significantly higher under 4 t ha⁻¹ pelleted vermicompost. However, test weight remained statistically non-significant.

Among scheduling treatments, split application (S₃) recorded significantly higher values compared to S₂ and S₁, indicating better nutrient synchronization.

The improvement in yield attributes may be attributed to enhanced nutrient availability, increased microbial activity and better translocation of assimilates towards reproductive structures. These findings are in conformity with Chavan *et al.* (2015) [4], Ahmadpour *et al.* (2016) [2] and Chaudhari *et al.* (2023) [5].

Yield

Application of pelleted vermicompost significantly increased seed yield, haulm yield and biological yield.

The highest seed yield (1190 kg ha⁻¹) was recorded under 4 t ha⁻¹, which was 7.58, 19.75, 30.49 and 56.46 per cent higher than 3, 2, 1 t ha⁻¹ and control, respectively. Haulm yield and biological yield followed a similar trend.

Among scheduling treatments, S₃ (split application) produced significantly higher yield than S₂ and S₁, due to continuous nutrient supply throughout crop growth stages.

The increase in yield may be attributed to improved soil structure, enhanced nutrient availability and slow release of nutrients from pelleted vermicompost. Presence of humic substances further improves nutrient uptake and plant growth. Similar results were reported by Afsharmanesh *et al.* (2016) [1].

Table 1.1: Effect of pelleted vermicompost and its scheduling on yield attributes of organic greengram

Treatments	Number of pods plant ⁻¹	Number seeds pod ⁻¹	Weight of seed pod ⁻¹ (g)	Test weight (g)
Doses of pelleted vermicompost				
Control	15.67	9.18	0.43	38.35
1 t ha ⁻¹	17.21	10.38	0.45	39.42
2 t ha ⁻¹	18.64	10.90	0.47	39.71
3 t ha ⁻¹	20.12	11.14	0.49	39.86
4 t ha ⁻¹	21.92	11.52	0.53	39.99
S.E.m.±	0.495	0.143	0.006	0.507
C.D.(P=0.05)	1.435	0.413	0.017	NS
Scheduling of pelleted vermicompost				
100% at sowing	17.12	10.09	0.45	39.04
50% at sowing + 50% at 4 WAS	18.95	10.60	0.47	39.36
50% at sowing + 25% at 4 WAS + 25% at 6 WAS	20.07	11.17	0.50	40.00
S.E.m.±	0.384	0.110	0.005	0.393
C.D.(P=0.05)	1.111	0.320	0.014	NS

Table 1.2: Effect of pelleted vermicompost and its scheduling on yield and harvest index of organic greengram

Treatments	Yield (kg ha ⁻¹)		
	Seed	Haulm	Biological
Doses of pelleted vermicompost			
Control	761	1961	2722
1 t ha ⁻¹	912	2395	3307
2 t ha ⁻¹	994	2646	3640
3 t ha ⁻¹	1106	2844	3950
4 t ha ⁻¹	1190	3038	4228
S.E.m.±	24	65	72
C.D.(P=0.05)	69	189	209
Scheduling of pelleted vermicompost			
100% at sowing	928	2398	3327
50% at sowing + 50% at 4 WAS	985	2550	3536
50% at sowing + 25% at 4 WAS + 25% at 6 WAS	1064	2782	3845
S.E.m.±	18	51	56
C.D.(P=0.05)	53	147	162

Conclusion

The present investigation clearly demonstrated that application

of pelleted vermicompost significantly improved yield attributes and yield of organic greengram. Among the treatments, application of pelleted vermicompost at 4 t ha⁻¹ proved most effective. Split application (50% at sowing + 25% at 4 WAS + 25% at 6 WAS) further enhanced crop performance.

Thus, application of pelleted vermicompost at 4 t ha⁻¹ along with split scheduling can be recommended for achieving higher productivity and profitability of organic greengram under similar agro-climatic conditions.

Acknowledgment

We are intensely thankful to the Department of Agronomy, Rajasthan College of Agriculture, MPUAT, Udaipur for providing us facilities for quality analysis of greengram.

References

1. Afsharmanesh R, Rahimi A, Torabi B, Akhgar A. Effects of vermicompost and compost tea application on the growth criteria of corn (*Zea mays*). Iranian J Field Crops Res. 2016;14(1):185-199.

2. Ahmadpour R, Hosseinzadeh SR, Chashiani S. Study of root morpho-physiological and biochemical characteristics of lentil (*Lens culinaris* Medik.) in response to moisture stress. J Plant Environ Physiol. 2016;11(43):39-51.
3. Ali M, Kumar S. Prospects of mungbean in rice-wheat cropping systems in Indo-Gangetic Plains of India. In: Improving income and nutrition by incorporating mungbean in the cereal fallows of the Indo-Gangetic Plains of South Asia. Rome: FAO; 2004. p. 246-254.
4. Chavan BL, Vedpathak MM, Pirgonde BR. Effects of organic and chemical fertilizers on cluster bean (*Cyamopsis tetragonoloba*). Eur J Exp Biol. 2015;5(1):34-38.
5. Chaudhari PR, Patel KI, Talaviya PL, Patel PD, Patel PM. Effect of different spacings under varying fertility levels on summer greengram (*Vigna radiata* L.). Pharma Innov J. 2023;12(2):1027-1032.
6. FiBL, IFOAM. The world of organic agriculture: statistics and emerging trends. 2021. p. 1-136.
7. Fisher RA. Statistical methods for research workers. Edinburgh, London: Oliver and Boyd; 1950.
8. Hernandez G, Dominguez DJ, Alvarado MO. An easy laboratory method for optimizing the parameters for the mechanical densification process: an evaluation with an extruder. Agric Eng Int. 2006. p. 120-125.
9. Panse VG, Sukhatme VP. Statistical methods for agricultural workers. New Delhi: Indian Council of Agricultural Research; 1985.