Available online at www.agrifarming.org

DOI: http://dx.doi.org/10.18782/2582-7146.327

ISSN: 2582 – 7146

Curr. Rese. Agri. Far. (2026) *7*(3), 66-70

Research Article

Current Research in Agriculture and Farming

Peer-Reviewed, Refereed, Open Access Journal

Performance of Taramira (*Eruca sativa* Mill.) Varieties under Integrated Nutrient Management for Sustainable Productivity

Abhishek Sharma*, P.K. Sharma, Arjun Lal Prajapat and Abhinav

Department of Agriculture, Vivekananda Global University, Jaipur, India

*Corresponding Author E-mail: sharmaabhishek1466@gmail.com

Received: 15.01.2026 | Revised: 18.03.2026 | Accepted: 29.03.2026

ABSTRACT

Taramira (Eruca sativa Mill.) is an important oilseed crop cultivated in the arid and semi-arid regions of India due to its drought tolerance and adaptability to marginal soils. However, its productivity remains low because of poor nutrient management and the cultivation of less productive varieties. Therefore, a field experiment was conducted during the Rabi season of 2025–26 at the Research Farm of Vivekananda Global University, Jaipur, Rajasthan, to evaluate the performance of taramira varieties under integrated nutrient management (INM). The experiment was laid out in a Factorial Randomized Block Design with three replications, comprising four varieties (RTM-314, RTM-1355, RTM-1351, and RTM-2002) and four nutrient management treatments: control, 50% NPS + vermicompost (VC) @ 5 t ha⁻¹, 75% NPS + VC @ 5 t ha⁻¹, and 100% NPS + VC @ 5 t ha⁻¹. Results revealed significant variations in yield and yield attributes among varieties and nutrient management practices. Variety RTM-2002 recorded the highest seed yield (990 kg ha⁻¹), straw yield (2075 kg ha⁻¹), and biological yield (3065 kg ha⁻¹), closely followed by RTM-1351. Among nutrient management treatments, application of 100% NPS + VC @ 5 t ha⁻¹ produced the maximum seed yield (1027 kg ha⁻¹), straw yield (2121 kg ha⁻¹), and biological yield (3148 kg ha⁻¹), which was statistically at par with 75% NPS + VC @ 5 t ha⁻¹. The study concludes that integration of recommended NPS fertilizers with vermicompost significantly enhances taramira productivity and can be recommended for sustainable production and improved soil health in semi-arid regions.

Keywords: *Taramira, drought tolerance, Rabi season, vermicompost, drought tolerance*

INTRODUCTION

Taramira (*Eruca sativa* Mill.), commonly known as rocket or arugula, is an important minor oilseed crop of the family *Brassicaceae* cultivated predominantly in the arid and semi-arid regions of India. The crop is highly valued for its remarkable tolerance to drought, poor soil fertility, and erratic rainfall, making it well suited to marginal and rainfed farming systems. Taramira is traditionally grown during the rabi season and serves as a dependable oilseed crop in areas where other conventional oilseeds often fail under moisture-stress conditions.

Cite this article: Sharma, A., Sharma, P. K., Prajapat, A. L., & Abhinav (2026). Performance of Taramira (*Eruca sativa* Mill.) Varieties under Integrated Nutrient Management for Sustainable Productivity, *Curr. Rese. Agri. Far. 7*(3), 66-70. doi: http://dx.doi.org/10.18782/2582-7146.327

Owing to its low input requirement and adaptability to harsh environments, taramira contributes significantly to the livelihood security of small and resource-poor farmers. India is one of the world's leading oilseed-producing countries, and although taramira occupies a relatively small share of the total oilseed area, it plays an important role in the dryland agriculture of north-western India. The crop is mainly cultivated in Rajasthan, Haryana, Uttar Pradesh, Madhya Pradesh, and Gujarat, with Rajasthan accounting for the largest area under cultivation. Recent estimates indicate that taramira occupies about 0.25–0.30 million hectares with a production of approximately 0.10–0.12 million tonnes and an average productivity of 400–600 kg ha^{-1} (Anonymous, 2024). The comparatively low productivity highlights the need for improved varieties and efficient crop management practices.

The crop thrives well in light-textured sandy and sandy loam soils under limited moisture availability. Its deep root system enables efficient extraction of water from deeper soil layers, making it particularly suitable for drought-prone regions. Despite its adaptability, taramira productivity is constrained by the cultivation of low-yielding varieties, poor nutrient management, and declining soil fertility. Considerable genetic variability exists among available varieties with respect to growth, yield attributes, and oil content, emphasizing the importance of varietal evaluation under diverse production environments.

Nutrient management is a critical factor influencing taramira growth and yield, especially in the nutrient-deficient soils of arid regions. Deficiencies of nitrogen, phosphorus, and sulfur frequently limit crop productivity and oil quality. Continuous dependence on chemical fertilizers alone may adversely affect soil health and sustainability. Consequently, Integrated Nutrient Management (INM), which combines inorganic fertilizers with organic nutrient sources, has emerged as an effective strategy for enhancing crop productivity while maintaining soil fertility. Among organic amendments, vermicompost has gained considerable attention due to its rich nutrient content and beneficial effects on soil physical, chemical, and biological properties. The integration of vermicompost with recommended fertilizer doses can improve nutrient availability, nutrient use efficiency, soil health, and crop productivity. Therefore, evaluating taramira varieties under integrated nutrient management practices is essential for developing sustainable production technologies capable of improving yield, profitability, and long-term soil health in arid and semi-arid regions.

MATERIALS AND METHODS

A field experiment entitled "Performance of Taramira (*Eruca sativa* Mill.) Varieties under Integrated Nutrient Management for Sustainable Productivity and Soil Health" was conducted during the Rabi season of 2025–26 at the Research Farm of Vivekananda Global University, Jaipur, Rajasthan, India. The experimental site is situated at 26°81′17″ N latitude and 75°88′99″ E longitude and falls under the Semi-Arid Eastern Plain Zone of Rajasthan.

The region experiences a semi-arid climate characterized by hot summers and cold winters. During the crop growing season, the maximum and minimum temperatures ranged from 20.1 to 33.3°C and –1.1 to 15.6°C, respectively. The total rainfall received during the cropping period was 39.5 mm, while relative humidity varied between 38 and 69%.

Before sowing, representative soil samples were collected from the experimental field (0–15 cm depth) and analyzed for physico-chemical properties. The soil was loamy sand in texture, having 84.8% sand, 7.2% silt, and 7.1% clay. It was low in organic carbon (0.20%) and available nitrogen (130.78 kg ha^{-1}), medium in available phosphorus (20.89 kg ha^{-1}) and potassium (241.25 kg ha^{-1}), with a pH of 7.31 and electrical conductivity of 0.24 dS m^{-1}.

The experiment was laid out in a Factorial Randomized Block Design (FRBD) with three replications comprising 16

treatment combinations. The treatments consisted of four taramira varieties, namely RTM-314, RTM-1355, RTM-1351, and RTM-2002, and four nutrient management practices: control (NM_0), 50% recommended NPS + vermicompost @ 5 t ha^{-1} (NM_1), 75% recommended NPS + vermicompost @ 5 t ha^{-1} (NM_2), and 100% recommended NPS + vermicompost @ 5 t ha^{-1} (NM_3). The recommended fertilizer dose was 60 kg N, 30 kg P_2O_5, and 20 kg S ha^{-1}. Half of the nitrogen along with the full dose of phosphorus and sulphur was applied as basal, while the remaining nitrogen was top-dressed at the first irrigation.

The crop was sown on 5 November 2025 using the kera method with a seed rate of 4 kg ha^{-1} and row spacing of 45 cm. Seeds were treated with Bavistin @ 3 g kg^{-1} seed before sowing. Standard agronomic practices, including thinning, hand weeding, and irrigation through the sprinkler method, were followed uniformly in all plots throughout the crop season.

Observations on plant stand, plant height, dry matter accumulation, yield attributes (number of siliquae $plant^{-1}$, seeds $siliqua^{-1}$, and test weight), seed yield, biological yield, harvest index, oil content, oil yield, and economics were recorded following standard procedures. Oil content was determined using the Soxhlet extraction method with petroleum ether as the solvent, and oil yield was calculated accordingly.

The experimental data were statistically analyzed using analysis of variance (ANOVA) appropriate for FRBD as described by Fisher (1950). The significance of treatment effects was tested at the 5% probability level, and treatment means were compared using the critical difference (CD) test wherever the F-test was significant. The standard error of mean [S.Em. (±)] and critical difference values were calculated to assess treatment differences.

RESULTS

Table 1: Effect of varieties and nutrient management on yield of Taramira

Treatments	Yield (kg/ha)			Harvest index (%)
	Seed	Straw	Biological	
Varieties				
RTM 314	722	1773	2495	28.93
RTM-1355	787	1833	2620	30.03
RTM 1351	963	2020	2983	32.28
RTM 2002	990	2075	3065	32.30
SEm ±	55	106	140	0.67
CD (P=0.05)	159	306	404	NS
Nutrient management				
Control	700	1513	2213	31.63
50% NPS + 5 t/ha VC	910	1890	2800	32.50
75% NPS + 5 t/ha VC	996	2073	3069	32.45
100% NPS + 5 t/ha VC	1027	2121	3148	32.62
SEm ±	55	106	140	0.67
CD (P=0.05)	159	306	404	NS

NS=Non-significant

Effect of varieties:

It is evident from the data in table 4.5 that seed yield of Taramira was significantly increased due to application of different varieties and significantly highest seed yield was recorded under the Taramira variety RTM 2002 over RTM 314 and RTM-1355. The corresponding increase in seed yield due to Taramira variety RTM 2002 was 990 kg/h.

Effect of nutrient management:

Further reference of data given in table 4.5 revealed that seed yield significantly enhanced due to nutrient management treatment and the significantly highest seed yield of Taramira was recorded with the application of 100% NPS + 5 t/ha VC which was statistically at par with 75% NPS + 5 t/ha VC and found superior to control and 50% NPS + 5 t/ha VC. Maximum seed yield due to application of 100% NPS + 5 t/ha VC was recorded (1027kg/h).

Straw yield (kg/ha) Effect of varieties:

A critical examination of data given in table 4.5 revealed that the straw yield of Taramira was affected significantly with the different varieties. Taramira variety RTM 2002 was recorded significantly highest straw yield which was statistically at par with RTM 1351and found superior to RTM 314 and RTM-1355. Maximum straw yield of Taramira due to Taramira variety RTM 2002 recorded 2075 kg/h.

Effect of nutrient management:

It was inferred from the data presented in table 4.5 that straw yield of Taramira was increased due to all the nutrient management treatment over control and application of 100% NPS + 5 t/ha VC was produced significantly maximum straw yield as compared to control and 50% NPS + 5 t/ha VC. Maximum straw yield recorded in application of 100% NPS + 5 t/ha VC 2121 kg/h.

Biological yield (kg/ha) Effect of varieties:

It was inferred from the data presented in table 4.5 that biological yield of Taramira was increased due to different varieties and maximum biological yield was obtained by Taramira variety RTM 2002 which was closely followed by RTM 1351but significantly higher than RTM 314 and RTM-1355. Maximum biological yield in Taramira variety RTM 2002 as compared to RTM 314 and RTM-1355 was 3065 kg/ha.

CONCLUSION

In the present investigation, there was significant improvement noted in yield attributes (number of siliqua plant^{-1} and number of seeds siliqua^{-1}) and yield (seed, stover and biological) of Taramira with nutrient management treatments. The maximum mean values of number of siliqua/plant, number of seeds/siliqua, seed yield, stover yield and biological yield of Taramira was obtained with the application of 100% NPS + 5 t/ha VC which was significantly higher as compared to control and application of 50% NPS + 5 t/ha VC.

The beneficial response of inorganic sources of nutrient with organic manure on yield attributes and yield of Taramira might be due to the availability of sufficient amount of plant nutrients throughout the growth period of crop resulting in better uptake of nutrients, plant vigour and improved yield. The positive effect of chemical fertilizer application in combination with vermicompost and biofertilizer on yield attributing characters of Taramira seems to be due to cumulative effect on growth and vigour of plants. By virtue of increased supply of metabolites, there might have been significant improvement in dry matter production with increasing fertilizer application. Increased growth components due to increased fertilizer levels might have provided stability in higher supply of photosynthates towards the sink (seeds/silique). The increased growth in terms of plant height, dry matter accumulation and number of branches/plant might also provided better sites for silique formation and seed development. As a result, almost all yield attributes of crop resulted into significant improvement due to fertilizer application. Organic matter is also a source of energy for soil micro- flora, which brings about the transformation of organic form of nutrients present in soil, into available form. The increase in the yield attributes with the application of organic manure ascribed to direct addition of plant nutrients (macro and micro) and growth regulators and also due to increased microbial population of soil, which accelerated the process of humification, removal of obnoxious smell and detoxification of soil pollutants. The increase in seed and stover yields with the application of chemical

fertilizers might be due to better nutritional environment in low status of nitrogen and phosphorus soil as evidenced by their uptake in the plant and due to the increased supply of N and P and their higher uptake by plants might have stimulated the rate of various physiological processes in plant and led to increased growth and yield parameters, resulted in increased seed and stover yield of the crop. The results of the present study are in close conformity with findings of Murali et al. (2018), Reddy and Singh (2018) and Sahoo et al. (2018) in Taramira crop.

Acknowledgements:
The authors sincerely thank all co-authors for their support and valuable contributions in completing this manuscript on time.

Funding:
Nil.

Conflict of Interest:
The authors declare that there is no conflict of interest regarding the publication of this manuscript.

Author Contribution:
All authors contributed to the critical revision of the manuscript and approved the final version for publication.

REFERENCES

Afroz, M. M. Sarkar, M. A. R. Bhuiya, M. S. U., & Roy, A. K. (2011). Effect of sowing date and seed rate on yield performance of two Taramira varieties, *Journal of Bangladesh Agricultural University, 9*(1), 5 - 8.

Akhila, K., Kaswala, A. R., Priyanka & Dubey, P. K. (2017). Effect of liquid fertilizers on nutrient uptake and soil properties of the green gram crop under organic farming, *The Pharma Innovation Journal 6*(11), 224-228.

Anonymous, (2024). Crop-wise Area, Production and Yield of Various Principal Crops (3rd Advance Estimates of Rabi 2023-24). *Commissonerate of Agriculture*, Jaipur, Rajasthan, pp: 1

Bhanuwanti, Gill, H. S., & Kaur, P. (2022). Effect of integrated nutrient management on timely sown crop of Indian Taramira (*Brassica juncea*). *Indian Journal of Agronomy 67*(4), 454-457.

Bharti, V., Lal, K., Prasad, S. S., Dwivedi, D. K., Kumar, R., & Chodhary, C. S. (2022). Assessment of nutrient and biofertilizers for productivity enhancement of Indian Taramira (*Brassica juncea* L.) *The Pharma Innovation Journal 11*(5), 1283-1287.

Bijarnia, A. L. Yadav, R. S. Rathore, P. S. Singh, S. P., & Jat, R. S. (2017). Study of integrated nutrient management and weed control measures on Indian Taramira [*Brassica juncea* (L.) Czern & Cosson] and its residual effect on fodder Pearlmillet (*Pennisetum glaucum* L) in North Western Rajasthan, *International Journal of Chemical Studies*, *5*(3), 314-318.

Walkley, A. J., & Black, I. A. (1934). Estimation of soil organic carbon by chromic acid titration method. *Soil Science 37*, 29-38.

western Himalayas. *Journal of Pharmacognosy and Phytochemistry*, *7*(6), 517-520.

Yadav, K. M., Chaudhry, S., Kumar, H., Singh, R., & Yadav, R. (2018). Effect of integrated nutrient management on growth and yield in Taramira [*Brassica juncea* (L.) Czern. & Coss]. *International Journal of Chemical Studies 6*(2), 3571-3573.