ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 17, Issue, 12, pp.35755-35756, December, 2025
DOI: https://doi.org/10.24941/ijcr.49899.12.2025

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EFFECT OF DIFFERENT ORGANIC INPUTS ON GROWTH AND YIELD OF RICE (*ORYZA SATIVA* L)

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ARTICLE INFO

Article History:
Received 19th September, 2025
Received in revised form
15th October, 2025
Accepted 31st November, 2025
Published online 30th December, 2025

Keywords:

Rice, Organic Farming, Seaweed Extract, Vermicompost, Yield Attributes, Growth Parameters.

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ABSTRACT

A field experiment was conducted during Kharif 2024–25 to study the effect of different organic inputs on growth and yield of rice variety Ratnagiri-8 at ASPEE Agricultural Research & Development Foundation, TansaFarm, Palghar, Maharashtra. Seven treatments comprising various organic nutrient sources were evaluated in a Randomized Block Design with three replications. Observations on plant height, number of tillers, panicles, panicle length, seeds per panicle, test weight, and yield were recorded. Results revealed that treatment T_5 (Seaweed extract) significantly outperformed other treatments in terms of growth parameters and yield attributes. Highest grain yield (6057kg ha^{-1}) and straw yield (7215 kg ha^{-1}) were recorded in T_5. The study concludes that seaweed extract is a promising organic input for enhancing productivity of rice under coastal Maharashtra conditions.

Citation: Dekhane, S. S., Pisal, R. R. and Patel, D. J. D. 2025. "Effect of Different Organic Inputs on Growth and Yield of Rice (*Oryza sativa* L.).". ***International Journal of Current Research, 17, (12), 35755-35756.***

INTRODUCTION

Rice (*Oryza sativa* L.) is the most important staple food crop of India and plays a vital role in ensuring food security. Continuous and excessive use of chemical fertilizers has led to degradation of soil structure, nutrient imbalance, and decline in soil organic carbon, thereby reducing long-term sustainability of rice production systems. Although chemical fertilizers provide quick nutrient availability, their indiscriminate use causes environmental issues such as groundwater contamination and reduced microbial activity. Organic farming has emerged as a sustainable alternative system that promotes soil fertility, enhances microbial population, and maintains ecological balance. Organic inputs such as farmyard manure (FYM), vermicompost, and seaweed extracts not only supply essential nutrients but also improve soil physicochemical properties and plant growth regulators. Bio-based products improve nutrient uptake efficiency and stress tolerance. Considering the need to reduce chemical inputs while maintaining productivity, this experiment was conducted to evaluate the effect of organic inputs on rice growth and yield.

MATERIALS AND METHODS

The experiment was conducted at the ASPEE Agricultural Research & Development Foundation Farm, Nare village, Taluka Wada, District Palghar, Maharashtra. The region represents a coastal agro-climatic belt with heavy monsoon rainfall and moderately fertile soil, ideal for lowland rice cultivation. The treatments were arranged in RBD with three replications to reduce experimental error. Organic inputs were incorporated into the soil before transplanting, while liquid formulations were applied as foliar sprays at 30 and 45 days after transplanting (DAT). Rice variety Ratnagiri-8 was used and seeds were treated with Thiram @ 3 g kg^{-1} and seedlings were raised in nursery beds. Transplanting was done after 25 days using two seedlings per hill at 20 × 15 cm spacing. Uniform weeding and plant protection measures were maintained for all treatments. Data were collected from five randomly selected plants per plot. Statistical analysis was performed using ANOVA suitable for RBD to assess treatment significance.

RESULTS AND DISCUSSION

The results of the present investigation clearly indicate that all organic inputs significantly influenced the growth, yield attributes, and yield of rice variety Ratnagiri-8. Among all the treatments, T_5 (Seaweed extract) exhibited superior performance across almost all recorded parameters.

Effect on Growth Attributes: Plant height, number of tillers per plant, and number of panicles per plant were significantly higher under seaweed extract treatment. This can be attributed to the presence of natural plant growth regulators such as auxins, cytokinins, gibberellins, and betaines in seaweed extracts that promote cell division, cell elongation, and chlorophyll synthesis. Enhanced plant height and tillering may also be due to improved nutrient uptake efficiency and stimulation of root growth.

Table 1. Effect of Organic Inputs on Growth and Yield of Rice

Treatment	Plant Height (cm)	No. of tillers per Plant	No. of Panicles per Plant	Length of panicle (cm)	No. of seeds Per panicle	Test Weight (g)	Grain Yield (kg/ha)	Straw Yield (kg/ha)
T1	84.87	10.07	7.4	23.38	223.4	17.13	1946	3104
T2	89.13	12.13	8.4	24.01	269.8	18.22	4646	5805
T3	90.22	12.4	8.8	24.16	284.53	18.55	4707	5865
T4	87.25	11.93	8.2	23.87	256	17.94	4522	5680
T5	92.32	13.27	9.93	25.23	296.33	19.63	6057	7215
T6	90.5	12.8	9.4	24.93	287.07	19.04	5182	6340
T7	85.95	11.33	7.93	23.63	242.13	17.52	4401	5559
S.Em.±	0.48	0.21	0.19	0.06	4.44	0.24	0.35	0.59
C.D.	1.48	0.66	0.58	0.2	13.68	0.74	1.07	1.82

Similar findings were reported by Rathore *et al*. (2009), who observed that seaweed extracts improved vegetative growth and physiological efficiency in crops. Increased tiller production is a direct indicator of improved nutrient availability and hormonal regulation, which leads to better crop establishment and higher sink capacity. T_6 (Bioloam Supreme) and T_3 (Vermicompost) showed statistically comparable values for growth parameters and ranked next to T_5. Vermicompost releases nutrients gradually, improves soil aggregation, and increases microbial activity, resulting in improved plant vigor.

Effect on Yield Attributes: Panicle length, number of seeds per panicle, and test weight are important yield-determining factors in rice. Treatment T_5 recorded the highest values for these parameters, indicating an improvement in assimilate production and translocation during grain filling stage.

Seaweed extract enhances photosynthesis rates, enzyme activity, and nutrient transport within plants, leading to more effective grain development. The improved test weight under T_5 suggests better grain filling and higher dry matter accumulation. The improved number of seeds per panicle and panicle length observed under T_5 is in agreement with the findings of Khan *et al*. (2009), who reported that seaweed extract application enhanced reproductive growth in cereals due to balanced nutrient supply and hormone regulation.

Effect on Grain and Straw Yield: The highest grain yield (6057kg ha^{-1}) and straw yield (7215kg ha^{-1}) recorded under T_5 indicate the overall effectiveness of seaweed extract as an organic growth stimulant. Higher straw yield reflects increased biomass accumulation and better nutrient utilization.

The grain yield advantage in T_5 may be due to:

- Increased tiller productivity,
- Greater panicle number,
- Improved grain filling, and
- Higher test weight.

T_6 (Bioloam Supreme) also produced significantly higher yield compared to the control, suggesting that microbial and enzymatic activity in bio-inputs plays a vital role in nutrient transformation and root development.

Sustainability Implications

Organic nutrient sources not only improved crop performance but also support sustainable agriculture by:

- Enhancing soil organic carbon,
- Improving microbial activity,
- Reducing chemical dependency,
- Minimizing environmental pollution.

Seaweed extract, in particular, emerges as a low-cost, eco-friendly, and effective alternative for improving rice productivity.

CONCLUSION

The study concludes that organic inputs significantly influence growth and yield of rice. Among all treatments, T_5 (Seaweed extract) proved to be the most effective, showing maximum growth, better yield attributes, and highest grain and straw yield. It can be recommended as an efficient organic nutrient input for rice cultivation under coastal agro-climatic conditions. Adoption of seaweed extract can help reduce chemical dependency while sustaining or improving rice productivity.

ACKNOWLEDGEMENT

The authors are grateful to the Directors of ASPEE Agriculture and Research Development Foundation,Malad, Mumbai, India for providing excellent facilities for conducting this research.

REFERENCES

Rathore, S. S., Chaudhary, D. R., Boricha, G. N., Ghosh, A., Bhatt, B. P., Zodape, S. T., &Patolia, J. S. (2009). Effect of seaweed extract on growth, yield, and nutrient uptake of soybean (Glycine max). *Journal of Scientific and Industrial Research,* 68, 1078–1082.

Khan, W., Rayirath, U. P., Subramanian, S., Jithesh, M. N., Rayorath, P., Hodges, D. M., *et al*. (2009). Seaweed extracts as biostimulants of plant growth and development. *Journal of Plant Growth Regulation*, 28, 386–399.

Zodape, S. T., Mukhopadhyay, S., Eswaran, K., Reddy, M. P., &Chikara, J. (2010). Enhanced yield and nutritional quality in green gram through seaweed extract application. *Journal of Scientific and Industrial Research*, 69, 468–471.

Arancon, N. Q., Edwards, C. A., Atiyeh, R., & Metzger, J. (2004). Effects of vermicomposts on growth and marketable fruits of field-grown tomatoes. *Pedobiologia*, 47(5–6), 731–735.

Subba Rao, N. S. (1999). *Soil Microbiology* (4th ed.). Oxford & IBH Publishing Co., New Delhi.

Ghosh, N., Singh, R. D., & Verma, M. R. (2004). Effect of FYM and biofertilizers on growth and yield of rice**.** *Indian Journal of Agronomy*, 49(3), 167–170.

Maheshwari, V. K., Bairwa, F. C., &Darvell, A. L. (2017). Organic inputs and nutrient management in rice cultivation. *International Journal of Current Microbiology and Applied Sciences*, 6(12), 2685–2695.

Pramanick, B., Brahmachari, K., & Ghosh, A. (2013). Effect of organic manures on growth and yield of rice. *The Bioscan*, 8(4), 1305–1309.

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