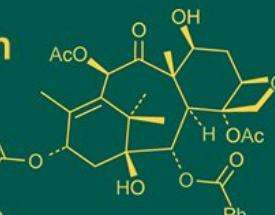


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Effect of fertilizer and seaweed extract on the yield traits of okra (*Abelmoschus esculentus* L.)

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Abstract

The current study, titled "Effect of Fertilizer and Seaweed Extract on the Yield Traits of Okra (*Abelmoschus esculentus* L.)," was conducted during the summer season of 2024-25 at the Instructional Farm, Khudmudi, under the College of Horticulture and Research Station, Sankara, Patan, Durg (Chhattisgarh), India. The experiment followed a Randomized Block Design (RBD) comprising nine treatment combinations and three replications. Treatments included the recommended dose of fertilizers (RDF) applied and in combination with seaweed extract at concentrations of 2% K SAP (*Kappaphycus alvarezii*) and 4% S SAP (*Sargassum* sp.) and control plot without seaweed application, was also maintained. Data on yield attributes were collected from five randomly selected plants within each treatment plot for every replication. The study revealed that the 75 % RDF and 4 % of S SAP foliar application (T₄) significantly recorded the highest number of fruits per plant (125.30), highest average fruit weight (10.41 g). Additionally, it produced the greatest total yield (156.63 q/ha) were all observed in T₄ (75 % RDF + 4 % S SAP). This treatment generated the highest economic return, recording a maximum benefit-cost ratio of 4.63. The results of the study indicate that the use of seaweed extract with RDF, particularly 75 % of RDF with 4 % S SAP (*Sargassum* sp.), significantly enhances crop productivity.

Keywords: Seaweed extract, *Sargassum*, *Kappaphycus*

Introduction

Okra (*Abelmoschus esculentus* (L.) Moench) commonly known as lady's finger or bhindi, belongs to the family Malvaceae. It is widely adopted vegetable in Indian kitchens and can be grown round the year. In India, it is widely grown in the states of Uttar Pradesh, Madhya Pradesh, Punjab, Haryana, Karnataka, Maharashtra and Gujarat. India produced about 175 million tonnes of vegetable from 10.3 million hectare. Okra fingers are excellent source of minerals which imparts resistance against many diseases. It is also good for patients suffering from cardiac disorders. Seaweed extract has gained significant attention in sustainable agriculture due to its natural bio-stimulant properties and ability to enhance crop performance without the adverse environmental effects associated with synthetic agrochemicals. Derived from marine macroalgae, seaweed extracts are rich in plant growth regulators such as auxins, cytokinins, and gibberellins, as well as essential nutrients including nitrogen, potassium, calcium, magnesium, and trace elements like zinc, manganese, and iron. When applied to crops like okra (*Abelmoschus esculentus*), seaweed extract has been shown to significantly improve germination rates, root and shoot development, and overall plant vigor. The hormonal activity in seaweed promotes enhanced vegetative growth characterized by larger leaves and stronger stems, leading to a more robust plant capable of higher productivity. Additionally, seaweed treatments often result in earlier flowering and improved fruit set, which is critical for maximizing yield in a short-season crop like okra.

However, limited information is available on the combined use of fertilizers and seaweed extracts on okra under local conditions. Therefore, the present investigation was undertaken to study the Effect of Fertilizer and Seaweed Extract on the yield traits of Okra.

Materials and Methods

The Experiment was carried out during summer season of the year 2024-25 at research farm village Khudmudi under College of Horticulture and research station, Sankara-Patan, Durg (C.G.). The experimental material consisted of nine treatments including control. Different inputs used include RDF and seaweed extracts. The experiment was laid out in a Randomized Block Design (RBD) with three replications.

Treatment Details

T ₀	Control
T ₁	100%RDF+2%KSAP
T ₂	100%RDF+4%SSAP
T ₃	75%RDF+2%KSAP
T ₄	75%RDF+4%SSAP
T ₅	50%RDF+2%KSAP
T ₆	50%RDF+4%SSAP
T ₇	25%RDF+2%KSAP
T ₈	25%RDF+4%SSAP

Climatic condition

Durg lies within the tropical climatic zone and receives the majority of its annual rainfall, ranging from about 1100 to 1276 mm, during the southwest monsoon season, primarily from June to October. Summers in the region are hot, with

temperatures varying between 30 °C and 47 °C, whereas winters are mild, with temperatures ranging from 5 °C to 25 °C.

Results and Discussion

Yield parameters

The results revealed that the significant differences were observed among treatments for number of fruit per plant, average weight of fruit and total yield at hectare levels (Table 1). The highest fruit yield per hectare (156.63 q/ha) and maximum average fruit weight (10.41 g) was recorded under T₄ (75% RDF + 4% S SAP), followed by T₃ (151.50 q/ha and 8.87 g fruit weight). The lowest yield was obtained in the control (T₀), which produced only 111.08 q/ha with 7.90 g fruit weight.

The superior performance of T₄ (75% RDF + 4% S SAP) may be attributed to the combined effect of balanced nutrient supply through reduced chemical fertilizers along with the beneficial role of SAP in improving soil moisture retention, nutrient availability, and uptake efficiency. This integration not only enhanced fruit weight but also increased the number of fruits per plant, ultimately resulting in higher yields. Similar positive impacts of integrating SAP with inorganic fertilizers on growth and yield of vegetable crops have been reported by Dwivedi *et al.* (2014) ^[4], Singh *et al.* (2012) ^[8].

Table 1: Effect of fertilizers and seaweed extracts number of fruits per plant, average weight of fruits (g) and fruit yield per ha (q)

Treatment notation	Treatments	Number of fruits per plant	Average weight of fruits (g)	Fruit yield per ha (q)
T ₀	Control	9.33	6.30	94.42
T ₁	100%RDF+2%KSAP	10.97	8.73	131.68
T ₂	100%RDF+4%SSAP	12.47	8.17	143.18
T ₃	75%RDF+2%KSAP	13.07	8.87	151.50
T ₄	75%RDF+4%SSAP	15.07	10.41	156.63
T ₅	50%RDF+2%KSAP	11.63	6.43	115.73
T ₆	50%RDF+4%SSAP	11.53	8.77	100.64
T ₇	25%RDF+2%KSAP	10.53	7.09	98.08
T ₈	25%RDF+4%SSAP	9.40	5.27	97.79
S.E.(m) ±		0.85	1.31	0.91
CD at 5%		2.49	3.83	2.66

Economic parameter

The results showed that significant variation in cost of cultivation, gross return, net return, and benefit-cost ratio (B:C) was observed under different nutrient management practices (Table 2). The highest cost of cultivation (₹61,798) was incurred with T₂ (100% RDF + 4% S SAP), while the lowest (₹55,148) was in T₀ (control). Gross return was maximum (₹2,81,925) in T₄ (75% RDF + 4% S SAP), compared to the minimum (₹1,69,950.6) in T₀(Control). Net return was also maximum (₹2,21,042) in T₄ (75% RDF + 4% S SAP), while the minimum (₹1,11,687.6) was recorded in T₇ (25% RDF + 2% K SAP). Similarly, the

highest B:C ratio (4.63) was obtained with T₄ (75% RDF + 4% S SAP), whereas the lowest (2.92) was recorded in T₀ (control). The superior economic performance of T₄ may be attributed to efficient nutrient utilization along with the beneficial effects of SAP in conserving soil moisture and enhancing fertilizer use efficiency, which ultimately resulted in higher yield and profitability. These findings are consistent with previous reports by Kumari (2021) ^[5], Barakat *et al.* (2021) ^[2], and Thirumaran *et al.* (2009) ^[10], who highlighted the positive economic impact of seaweed extract in vegetable cultivation.

Table 2: Effect of fertilizers and seaweed extracts on economics of various treatments

Treatments notation	Treatment	Total cost of cultivation	Gross return	Net return	B:C ratio
T ₀	Control	55,148.00	169950.6	111687.6	2.92
T ₁	100%RDF+2%KSAP	60,698.00	237029.4	176331.4	3.91
T ₂	100%RDF+4%SSAP	61,798.00	257722.2	195924.2	4.17
T ₃	75%RDF+2%KSAP	59,883.00	272700	212817	4.55
T ₄	75%RDF+4%SSAP	60,883.00	281925	221042	4.63
T ₅	50%RDF+2%KSAP	59,073.00	208305	149232	3.53
T ₆	50%RDF+4%SSAP	60,073.00	181148.4	121075.4	3.02
T ₇	25%RDF+2%KSAP	58,263.00	199949.4	144801.4	3.63
T ₈	25%RDF+4%SSAP	59,263.00	176018.4	116755.4	2.97

Conclusion

The findings of the present study indicate that the application of specific concentrations of Seaweed Extract can significantly enhance the growth and yield performance of okra. The comparison of different treatments revealed that the foliar application of 4 % SWE with 75 % RDF was the most effective in improving both yield traits. This treatment recorded the highest number of fruits per plant (125.30) average fruit weight (10.41 g), and total yield (156.63 q/ha). It also resulted in the highest economic return, with a maximum net return and a favourable benefit-cost ratio (4.63). These results suggest that the use of Seaweed Extract with combination of Fertilizer, can play a vital role in enhancing both productivity and profitability in okra cultivation.

tetragonoloba (L.) Taub. Am Eurasian J Agron. 2009;2(2):50-56.

References

1. Effect of different concentrations of aqueous *Ascophyllum nodosum* extract on flowering and fruiting in some vegetables. Bayero J Pure Appl Sci. 2017;10(1):306-310.
<https://doi.org/10.4314/bajopas.v10i1.59S>
2. Barakat MR, Abdel-Aal AM, Salem MA. Effect of phosphorus fertilization and foliar application with seaweed extracts and micronutrients on vegetative growth and seed yield of okra. Middle East J Appl Sci. 2021;11(2):234-245. Available from: https://mjppf.journals.ekb.eg/article_193751.html
3. Chaitra AJ, Mallikarjuna Gowda AP, Manjunath B. Effect of biostimulants on growth, yield, quality and biotic resistance in chilli (*Capsicum annuum* L.). Int J Plant Soil Sci. 2024;36(5):515-521.
<https://doi.org/10.9734/ijpss/2024/v36i54548>
4. Dwivedi SK, Meshram MR, Pal A, Pandey N, Ghosh A. Impact of natural organic fertilizer (seaweed saps) on productivity and nutrient status of black gram (*Phaseolus mungo* L.). Int Q J Life Sci. 2014;9(4):1535-1539.
5. Kumari P. Effect of biostimulants on growth, yield and quality of okra (*Abelmoschus esculentus* L. Moench). Junagadh: Junagadh Agricultural University; 2021. Available from: <https://krishikosh.egranth.ac.in>
6. Rathore SS, Chaudhary DR, Boricha GN, Ghosh A, Bhatt BP, Zodape ST, et al. Effect of seaweed extract on the growth, yield and nutrient uptake of soybean (*Glycine max*) under rainfed conditions. S Afr J Bot. 2009;75(2):351-355.
7. Sahu A, Baghel D, Singh AK, Chowdhury T, Soni R. Effect of biostimulant (plant probiotics) on growth, yield and microbial activity of chickpea (*Cicer arietinum* L.) grown in vertisol of Chhattisgarh. Br J Appl Sci Technol. 2023;42(47):128-135.
8. Singh AK, Verma HN, Rai DK. Effect of plant growth regulators on flowering and fruiting in okra. Int J Agric Sci. 2012;4(2):157-160.
9. Swarnam TP, Velmurugan A, Lakshmi NV, Kavitha K. Foliar application of seaweed extract on yield and quality of okra (*Abelmoschus esculentus* L.) grown in a tropical acid soil. Trends Biosci. 2021;13(6):1155-1160.
10. Thirumaran G, Arumugam M, Arumugam R, Anantharaman P. Effect of seaweed liquid fertilizer on growth and pigment concentration of *Cyamopsis*