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Enhancing sweet basil (*Ocimum basilicum* L.) yield, soil health and economic returns using *Jeevamrit* and *Kunapajala* in the Shivalik Himalayan Region of India

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ABSTRACT

A field experiment was conducted during the Kharif season of 2019 at Medicinal Plants Research and Development Centre (MRDC) of G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand to study the effect of jeevamrit and kunapajala on herbage yield and quality of sweet basil (Ocimum basilicum L.). The experiment was laid out in Randomized Block Design with eight treatments replicated thrice. Treatments i.e. T_1: recommended dose of fertilizer (RDF) (120-60-40) kg/ha, T_2: 15 t/ha farmyard manure (FYM), T_3: 500 l/ha kunapajala, T_4: 1000 l/ha kunapajala, T_5: 500 l/ha kunapajala + 7.5 t/ha FYM, T_6: 500 l/ha jeevamrit, T_7: 1000 l/ha jeevamrit, T_8: 500 l/ha jeevamrit+ 7.5 t/ha FYM. Results revealed that application of 15 t/ha FYM showed lowest bulk density (1.552 g cc^{-1}) and highest organic carbon content (0.860%). The maximum available N (212.75 kg/ha), P (24.31 kg/ha) and K (203.53 kg/ha) was recorded under treatment T_1. Significantly highest population of bacteria (20.01×10^4 CFU/g soil), fungi (5.00×10^4 CFU/g soil) and actinomycetes (9.00×10^4 CFU/g soil) recorded in T_8. Treatment T_1 recorded highest net return (₹ 2,54,810/ha) as well as herbage yield (271.86 q/ha).

Keywords: *Jeevamrit*, *Kunapajala*, net return, *Ocimum basilicum*, organic, yield

INTRODUCTION

Sweet basil (*Ocimum basilicum* L.) of the Lamiaceae family is one of the most significant medicinal and aromatic plants cultivated in India. It comprises nine subspecies, either annual or perennial, primarily from the basilicum and sanctum species, known for their use in essential oils and fragrances (Chandel *et al.*, 2024; Corrado *et al.*, 2020). This crop thrives in warm tropical climates and has a short growing period of 75-90 days. India accounts for approximately 60% (3000 ha) of the global cultivation area (5000 ha) and produces around 70% (350 tons) of the world's annual basil oil output (500 tons) (Sanganeria, 2010). The leaves and seeds are the most economically valuable parts of the plant. Various parts of sweet basil contain a diverse group of aromatic compounds, highly valued for their flavor and fragrance (Corrado *et al.*, 2020). Its essential oil is rich in compounds such as monoterpenes, phenols, sesquiterpenes, eugenol, methyl eugenol, thymol, methyl cinnamate, linalool, methyl chavicol, Citral 'A' and 'B', alcohol, and camphor, which contribute to its distinctive aroma and flavor profile (Hallmann *et al.*, 2024). The oil of sweet basil finds different uses in the cosmetic and perfumery industries and also in indigenous system of medicine. Its oil is utilized for flavouring food stuff in confectionary, thermogenic, cardiotonic, condiments, depurative, dental cream and mouth freshener and other countless indigenous and ayurvedic health care system (El-Mahrouk *et al.*, 2024). Its extract can be utilized as bio-insecticide, fungicide, antifeedants and preparation of food products. Basil's oil has stimulant, stomachic, demulcent and expectorant action. The leaves are acrid, aromatic, bitter, appetizing, carminative, digestive, anthelmintic and cardiotonic (Spence, 2024). A little work has been accomplished so far on mineral nutrition of different medicinal and aromatic crops including sweet basil (*Ocimum basilicum* L.). The organic fertilization is not just a cost effective and ecofriendly, but improves soil environment, yield and oil quality of medicinal and aromatic plants. The nutrients present in the soil don't remain in available form for the plants, they first need to be converted into the available form. However immoderate use of chemical products has disturbed the flora as well as fauna along with the population of micro-organisms and population of earthworms is almost negligible. For the liquid biofertilizers, a better option is described in ancient Indian literature with more scientific and clinical formulation under the generic name "*kunapajala*" given by Surapala (Surapala, 1996) in 'Vrikshayurveda' literature. These promote biological activities in the soil as well as make the nutrients available to crops. Organic liquid manure *i.e. jeevamrit* is a rich bio-formulation which contains consortia of beneficial microbes (Pathak and Ram, 2013). *Jeevamrit* can also add nitrogen to the soil by increasing non-symbiotic nitrogen fixation. Different levels of nitrogen-fixing rhizobia have been observed to increase during preparation of *jeevamrit* to 4,400% of the starting mixture (Smith *et al.*, 2020). Therefore, keeping these facts in view, the present study entitled "*Jeevamrit* and *Kunapajala* role in enhancing yield, soil health, and economics of Sweet Basil (*Ocimum basilicum* L.) in the foothills of Shivalik Himalayan, India" was carried out.

MATERIALS AND METHODS

Experimental site: The field experimentation on Sweet basil variety CIM-Saumya was conducted at Medicinal Plants Research and Development Centre, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, U.S. Nagar, Uttarakhand during the *Kharif* season of 2019. Pantnagar lies in *tarai* belt, 30 kms Southward to the foothills of Shivalik range of Himalayas at 79°, 29′ E longitude and at an altitude of 243.83 meter above mean sea level under subtropical humid climate. The soils of *tarai* region are of order Mollisol, sandy clay loam in texture. The experimental soil was sandy clay loam in texture, neutral in reaction, medium in organic carbon (0.68%), low in available nitrogen (186.60 kg/ha) and medium in phosphorus (18.90 kg/ha) and potassium (201.23 kg/ha).

Experimental details: The experiment was designed in Randomized Block Design with 8 treatments replicated thrice. A total of 24 plots each with gross plot size of 5.0 x 3.2 m and a net plot size of 3.5 x 2.4 m were made.

Treatment details: FYM @ 15 tonnes/ha as a control and different doses of *jeevamrit* and *kunapajala* along with a basal application of FYM @ 7.5 t/ha were applied with total eight treatments. T_1: RDF (N_{120}-P_{60}-K_{40}) kg/ha); T_2: FYM @ 15 t/ha, T_3: *Kunapajala* @ 500 l ha^{-1}, T4: *Kunapajala* @ 1000 l ha^{-1}, T_5: *Kunapajala* @ 500 l ha^{-1} + FYM @ 7.5 t/ha, T_6: *Jeevamrit* @ 500 l ha^{-1}, T_7: *Jeevamrit* @ 1000 l ha^{-1}, T_8: *Jeevamrit* @ 500 l ha^{-1} + FYM @ 7.5 t/ha

Cultural operations: The experimental field was ploughed by disc plough followed by two harrowing and leveled by using wooden plank. Well decomposed FYM was incorporated in the field 10 days before the planting. The recommended dose of fertilizer (120:60:40) kg/ha in the form of urea, diammonium phosphate (DAP) and muriate of potash (MOP) were applied in the field. Uniform amount of *jeevamrit* (200 l) and *kunapajala* (200 l) were applied in the plots before planting of the seedlings. After that, both the formulations were applied at regular intervals of 15, 30, 45, and 60 days after transplanting up to the final harvest of the crop. A total of 2 irrigations were given during the entire growth period. Manual weeding and mulching were done to check the weed flora. The crop was harvested at 80 DAP manually with the help of sickle by cutting plant at ground level in the plots leaving a border of 50 cm.

Preparation of organic sources of nutrients

Beejamrit and *jeevamrit* were prepared by the method developed by Padmashri Shri Subhash Palekar (Palekar, 2006) who is a strong promoter of natural farming and *kunapajala* was prepared by the method developed by Nene (2012)

Observations

Fresh herbage yield

$$\text{Total herbage yield (q ha}^{-1}\text{)} = \frac{\text{Weight of plants harvested from net plot area (kg)}}{\text{net plot area } \times 100} \times 10000$$

Bulk density (g/cc)

Bulk density (g/cc) was measured from the pre-noted weight of the dried sample and the total soil volume (Black, 1971).

$$\text{Bulk density } = \frac{\text{Dry weight of soil}}{\text{Total volume of soil}}$$

Soil Analysis

Organic carbon: Organic carbon content in soil was measured by using by using Modified Walkley and Black method (Jackson, 1973)

Available nitrogen: Subbiah and Asija (1956) method was followed for the estimation of available nitrogen.

Available phosphorus: Available phosphorus estimation in soil was done by Olsen's method (Olsen *et al*., 1954). The intensity of blue color was recorded at 660 nm on Spectrophotometer.

Available potassium: Available potassium determination in soil was done by using Flame photometer (Perur *et al*., 1973).

Microbial analysis

Present study is based on to find out the changes in population dynamics of microbes before and after the soil drenching of biozyme (*jeevamrit* and *kunapajala*) and other organic sources as given by Wollum (1982).

Statistical analysis

Experimental data was analyzed by adopting the standardized procedure for randomized block design (RBD) with the help of computer having analysis for R.B.D (STPR-3), programmed by the Department of Mathematics and Statistics, College of Basic Sciences and Humanities, G.B. Pant University of Agriculture and Technology, Pantnagar.

RESULT AND DISCUSSION

Yield

All the treatments had a positive and significant influence on the crop fresh biomass yield (Fig. 1). The application of NPK (120:60:40 kg/ha) *i.e.*, T_1 recorded significantly the highest fresh herbage yield (271.86 q/ha). It was closely followed by *jeevamrit* @ 500 L + FYM @ 7.5 t/ha (256.07 q/ha) *i.e.* T_8 followed by *kunapajala* @ 500 L + FYM @ 7.5 t/ha (244.03 q/ha) *i.e.* T_5 and these were found statistically *at par* to T_1 (271.86 q/ha). The lowest fresh herbage yield was recorded in T_2 applied with FYM (15 t/ha) alone (199.57 q/ha) and application of different doses of *jeevamrit* and *kunapajala* alone or their combination with FYM *i.e.* T_3, T_4, T_5, T_6, T_7, T_8 showed significantly higher fresh herbage yield as compare to FYM alone. The results obtained during the course of experiment indicated that there was a significant increase in fresh herbage yield which is due to more contribution of yield attributing parameters. Many successful attempts to show the beneficial effects of fermented liquid formulation on crop growth were done by Balakumbahan *et al.* (2010) in *Acorus calamus*. Similarly, Chauhan (2019) recorded higher fresh biomass yield in bramhi at different doses of *jeevamrit* combined with FYM.

Soil fertility

Soil bulk density

The soil bulk density was significantly influenced by different treatments (Table 1). The lowest bulk density was observed in T_2 (1.552 g/cc) followed by T_8 (1.602 g/cc) followed by T_5 (1.612 g/cc) as T_2, T_8 and T_5 treatments comprised of organic manures. The highest bulk density was recorded in T_1 (1.643 g/cc) which was significantly higher than solely applied FYM T_2 and organic formulations combined with FYM treatments T_8 and T_5. Among the different liquid manures treatments, the lowest bulk density was recorded in treatment T_8 (1.602 g/cc). The bulk density of soil in case of organic manure is lowest as compared to the other treatments because the microbial population is higher in the former and microbes feed on the carbon, evolved CO_2 which creates air spaces that makes the soil more porous and absorptive which in turn decreases the bulk density of the soil. Similar findings were also reported by Weber *et al.* (2007).

Organic carbon

Organic carbon was considerably affected by all the treatments (Table 1). The treatments comprising of organic source *i.e.*, FYM in different concentrations had higher values of organic carbon in comparison with the inorganic treatment and liquid manure formulation. Treatment T_2 had the highest organic carbon content (0.860%) which was significantly higher over all the other treatments except T_8 (0.783%) and T_5 (0.780%) to which it was *at par* with. The other treatments comprising of liquid manures had organic carbon content in the medium range. The highest organic carbon content among the liquid manures treatments was obtained in the soil drenched *jeevamrit* and FYM mixture *i.e.*, T_8 (0.783%) which showed a decreasing trend with the solid application of *jeevamrit i.e.*, T_7 (0.75%), T_6 (0.73%) similar trend was recorded in case of *kunapajala*. The lowest organic carbon content was observed in RDF treatment T_1 (0.69%) which was 19.7% lower than treatment T_2. Similar finding was reported by (Chandel *et al.*, 2024).

Available NPK

The significant influence of different treatments was observed on the available nitrogen, phosphorus and potassium in the soil (Table 1). The maximum available nitrogen was recorded in treatment T_1 (212.75 kg/ha) which was significantly superior to all the treatments except T_8 (198.63 kg/ha) to which it was *at par*. The lowest available nitrogen was found in treatment T_2 (180.80 kg/ha) which was 15.05% lower than treatment T_1. The higher amount of available nitrogen was recorded when *jeevamrit* or *kunapajala* combined with FYM as compare to solely applied *jeevamrit* or *kunapajala* or FYM because of FYM acts as organic food for microbial consortia present in liquid manures that help in mineralization and increased nitrogen availability as well as other nutrients. The high amount of available nitrogen was reported in RDF because of the split application of nitrogen that increased the soil fertility and its availability to the plant system **(**Chandel *et al.*, 2024). The treatment T_1 had the highest available phosphorus (24.31 kg/ha) which was significantly superior to all the other treatments. The lowest content of available phosphorus was observed in treatment T_3 (15.57 kg/ha) which was 35.90 % lower than treatment T_1. The T_1 treatment had the highest available potassium content (203.53 kg/ha) which was significantly greater than most of the treatments except T_8 (197.84 kg/ha). The lowest available potassium content was recorded in treatment T_3 (189.39 kg/ha) which was 7.11% lower than treatment T_1.

Bacterial population

Different treatments had a remarkable effect on the soil bacterial population after crop harvest (Table 1). Significantly highest population of bacteria was recorded in T_8 with application of *jeevamrit* @ 500 l/ha + FYM @ 7.5 t/ha (20.01×10^4 CFU/g soil) was *at par* with T_2 (17.70×10^4 CFU/g soil), T_5 (16.83×10^4 CFU/g soil) and T_7 (14.93×10^4 CFU/g soil). These treatments were significantly superior to the T_1 (8.04×10^4 CFU/g soil). Significantly lower microbial activity with application of *jeevamrit* (T_6) and *kunapajala* alone (T_3) might be attributed to the absence of source of organic carbon for further multiplication of bacteria, fungi and actinomycetes and a higher microbial activity with application of FYM (T_2) might be due to the presence of microbial inoculums (*jeevamrit*). Similar results were also obtained by Ravusaheb (2008) in sesame, Shwetha (2008) in soybean. The results are also in accordance with the findings of Siddappa (2015) in filed bean, where higher population of bacteria, fungi and actinomycetes was recorded with *jeevamrit* @ 1500 L ha^{-1} followed by *jeevamrit* @ 1000 L ha^{-1}.

Fungi population

Fungi population in the soil after harvest of basil was recorded significantly highest (Table 1) in T_8 with application of *jeevamrit* @ 500 l/ha + FYM @ 7.5 t/ha (5.00×10^4 CFU/g soil). It was statistically equal to FYM 15 t/ha (4.67×10^4 CFU/g soil). Significantly lower fungi population was recorded in T_1 with application of recommended dose of NPK (1.47×10^4 CFU/g soil). A similar observation as that of bacterial population was recorded here wherein the fungal population decreased with the decreased dose of liquid manures from treatment T_7 to T_6 in *jeevamrit* and from treatment T_7 to T_6 in *kunapajala*. The treatment T_3 (1.93×10^4 CFU/g soil) and T_6 (2.00×10^4 CFU/g soil) which is a sole organic liquid manure application without the FYM had lower fungal population as compared to T_5 (3.90×10^4 CFU/g soil), T_8 (5.00×10^4 CFU/g soil). Kumbar *et al*. (2016) found that the population of soil microbes increased with the application of biozyme *viz*., bacteria (47.44×10^6 CFU/g soil), fungi (31.22×10^4 CFU/g soil) and actinomycetes (31.44×10^4 CFU/g soil). Similar results were also reported by Chauhan (2019) in bramhi, where she reported 64.42% less microbial count in RDF as compared to *jeevamrit* @ 5000 l/ha + FYM @ 2.5 t/ha.

Actinomycetes population

Significantly higher population was noted with T_8 *i.e*., application of *jeevamrit* @ 500 l/ha + FYM @ 7.5 t/ha (9.00×10^4 CFU/g soil) which was significantly superior to the rest of the treatments (Table 1). The actinomycetes population in liquid manures treatments was found to decrease as the dose of formulation decreased *i.e*., it was highest in treatment T_7 (4.00×10^4 CFU/g soil) and lowest in treatment T_6 (2.10×10^4 CFU/g soil) similar trend was recorded in *kunapajala* treatments *i.e*. highest in T_4 (2.33×10^4 CFU/g soil) and lowest in T_3 (2.10×10^4 CFU/g soil). Significantly lower actinomycetes population was recorded in T_1 with application of suggested dose of NPK (1.70×10^4 CFU/g soil). The results are also matched with the findings of Kaur (2019), where he reported significantly higher population of bacteria (32.69×10^6 CFU/g soil), fungi (24.86×10^3 CFU/g soil) and actinomycetes (6.02×10^2 CFU/g soil) in plot treated with *jeevamrit* @ 20 per cent at two weeks interval among all treatments.

Total microbial population

Total microbial population in soil after harvest of basil recorded significantly superior in T_8 (34.01×10^4 CFU/g soil) which was highest than all other treatments (Table 1). It was statistically *at par* with T_2 (30.07×10^4 CFU/g soil) followed by T_5 (25.83×10^4 CFU/g soil). Among the liquid manures treatments, the highest total microbial population was recorded in treatment T_7 (18.4×10^4 CFU/g soil) followed by T_6 (13.00×10^4 CFU/g soil). The treatment T_1 comprising of RDF had the lowest population of microbes (11.20×10^4 CFU/g soil) which was 67.03% less than treatment T_8 which has the microbial formulation combined with FYM. As *jeevamrit* contains immense amount of microbial load which multiplies in the soil and functions as a tonic to improve the microbial activity in the soil (Palekar, 2006) and FYM has favourable effects on the soil properties which might have lowered the bulk density and improved soil aeration and also provided carbon as energy source to the microbes present in liquid manures for their rapid multiplication and survival. Devakumar *et al*.

(2014) revealed that use of handful of virgin soil for *jeevamrit* preparation performed as a source of initial inoculums of fungi, bacteria and actinomycetes, P- solubilizers and N-fixers. Consequently, more no. of beneficial microorganisms was observed in liquid manure formulation. These findings are also resembled with the study of Papen *et al.* (2002).

Economics

Cost of cultivation

Cost of cultivation (Table 2) varied with different treatments wherein, the highest cost of Cultivation was recorded in FYM @ 15 t/ha (₹ 81,520/ha) followed by *Kunapajala* @ 500 t/ha + FYM @ 7.5 t/ha (₹ 69,440/ha) and *jeevamrit* @ 500 t/ha + FYM @ 7.5 t/ha (₹ 69423/ha). The lower doses of *jeevamrit* or *kunapajala* had low cultivation cost which increases with increasing dose of formulation (T_4, T_7) but the amount of applied FYM increased the cost of cultivation in treatments T_5 (₹ 69,440/ha) and T_8 (₹ 69,423/ha). The minimum cultivation cost among treatments was found in treatment T_6 consisting of *jeevamrit* @ 500 t/ha (₹ 55,673/ha).

Gross returns

The gross returns are directly related to the total oil yield of each treatment and so vary significantly with each other (Table 2). The highest gross returns were obtained from T_1 *i.e.*, recommended dose of fertilizers (₹ 3,15,333/ha). Followed closely by the *jeevamrit* combined with FYM (₹ 3,04,788/ha) and followed by *kunapajala* combined with FYM (₹ 2,84,845/ha). The lowest gross return was obtained in treatment T_2 *i.e.*, FYM @ 15 t/ha (₹ 2,21,614/ha).

Net return

The maximum net return (Table 2) was obtained in treatment T_1 *i.e.*, Recommended dose of fertilizers (₹ 2,54,810/ha) which was followed by treatment *jeevamrit* @ 500 t/ha + FYM @ 7.5 t/ha (₹ 2,35,365/ha). Among different treatments of solely applied liquid manures, higher dose of *jeevamrit* + FYM *i.e.*, T_7 had the higher net returns (₹2,72,556/ha). The lowest net returns were obtained in treatment T_2 (₹1,40,094/ha) which is the FYM @ 15 t/ha treatment.

Benefit- Cost ratio (B: C ratio)

The maximum B: C ratio (Table 2) was obtained in treatment T_1 (4.21) which was highest among all while minimum B: C ratio was obtained in treatment T_2 (1.72). Highest benefit-cost ratio was seen in RDF as compared to other treatments because the gross returns (directly related to the total herbage yield) may be higher but the cost associated with liquid manure and FYM is also higher than RDF. A low B: C ratio is obtained in FYM combination because the yield is less and so are the gross returns in this treatment. Similar findings were also obtained by Amareshwari and Sujathamma (2015) and Manjunatha *et al.* (2009). It was noted that application of *jeevamrit* is one of the cheapest and efficient natural substitutes along with other organic manures like FYM, *ghanjeevamrit* in integrated approach for high crop yield and profitability, besides improving the nutrient status of the soil. Kasbe *et al.* (2015) also found application of liquid manure to be cost effective treatment. Similar results were obtained by Chauhan (2019) in bramhi where, she reported that application of biozyme integrated with FYM recorded higher benefit-cost ratio.

CONCLUSION

Based on the above findings, it can be concluded that *jeevamrit* @ 500 l/ha combined with half of the recommended dose of farmyard manure (7.5 t/ha) is sufficient to supply nutrients to crops, increases fresh herbage yield, maintain soil health and enhance profitability. It can be an alternate production technology to organic farmers and new vision to scientific community for further refinement and validation of age-old farming practices in present scenario to produce safe food, sustain soil health and to save the environment.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Table 1: Bulk density, bacteria, fungi, actinomycetes and total microbial population in soil (0-15 cm), organic carbon content and available NPK after harvest of sweet basil as influenced by the treatments

Treatments details	**B.D. (g/cc)**	**Organic carbon(%)**	**Available NPK (kg/ha)**			**Bacteria ×10^4 CFU/g**	**Fungi ×10^4 CFU/g**	**Actinomycetes ×10^4 CFU/g**	**Total Count ×10^4 CFU/g**
			N	**P**	**K**				
T_0: Initial microbial population	1.570	0.68	186.60	18.90	201.23	5.16	0.83	0.72	6.71
T_1:RDF (N_{120}:P_{60}:K_{40}) kg/ha	1.643	0.69	212.75	24.31	203.53	8.04	1.47	1.70	11.21
T_2:FYM @ 15 t/ha	1.552	0.86	180.73	18.36	193.21	17.70	4.67	7.70	30.07
T_3:*Kunapajala* @ 500 t/ha	1.641	0.71	183.39	15.57	189.39	8.93	1.93	2.10	12.97
T_4:*Kunapajala* @ 1000 t/ha	1.632	0.72	187.25	16.17	190.92	14.30	2.07	2.33	18.70
T_5:*Kunapajala* @ 500 t/ha + FYM @ 7.5 t/ha	1.612	0.78	193.80	18.66	194.21	16.83	3.90	5.10	25.83
T_6:*Jeevamrit* @ 500 t/ha	1.640	0.73	185.27	15.87	190.12	10.87	2.00	2.10	14.97
T_7:*Jeevamrit* @ 1000 t/ha	1.632	0.75	188.17	16.77	191.02	14.93	2.57	3.47	20.97
T_8:*Jeevamrit* @ 500 t/ha + FYM @ 7.5 t/ha	1.602	0.78	198.63	19.06	197.84	20.01	5.00	9.00	34.01
S.Em±	0.002	0.03	5.86	1.57	2.39	1.76	0.24	0.38	1.87
CD at 5%	0.007	0.08	17.13	4.59	6.99	5.16	0.70	1.11	5.46

Table 2. Economics of the crop as influenced by different treatments

Treatments details	Total cost (₹/ha)	Gross returns (₹/ha)	Net returns (₹/ha)	B: C ratios
T_1:RDF (N_{120}-P_{60}-K_{40}) kg/ha	60524	315333	254810	4.21
T_2:FYM @ 15 t/ha	81520	221614	140094	1.72
T_3:*Kunapajala* @ 500 t/ha	55690	227401	171711	3.08
T_4:*Kunapajala* @ 1000 t/ha	56695	255791	199096	3.51
T_5:*Kunapajala* @ 500 t/ha + FYM @ 7.5 t/ha	69440	284845	215405	3.10
T_6:*Jeevamrit* @ 500 t/ha	55673	241966	186293	3.35
T_7:*Jeevamrit* @ 1000 t/ha	56660	272556	215896	3.81
T_8:*Jeevamrit* @ 500 t/ha + FYM @ 7.5 t/ha	69423	304788	235365	3.39

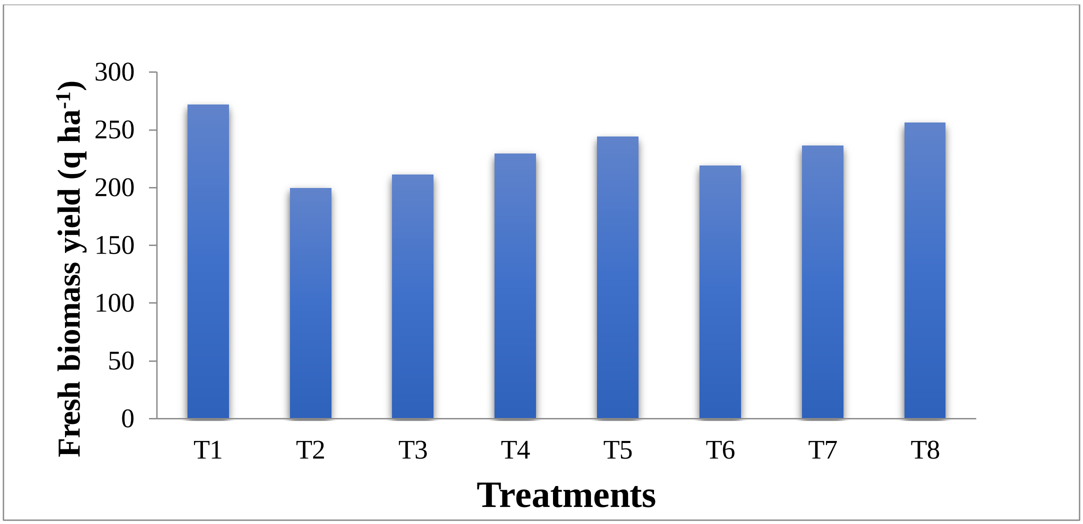

Figure 1. Fresh biomass yield (q/ha) as affected by different treatment