International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
© Agronomy
NAAS Rating (2025): 5.20
www.agronomyjournals.com
2025; 8(10): 54-58
Received: 25-08-2025
Accepted: 06-09-2025

Mahammad Riyaz
M.Sc. Scholar, Department of Agronomy, College of Agriculture, Raichur, University of Agricultural Sciences, Raichur, Karnataka, India

Ramesha YM
Associate Professor, Department of Agronomy, Agricultural Research Station, Dhadesugur, University of Agricultural Sciences, Raichur, Karnataka, India

Krishnamurthy D
Associate Professor, Department of Agronomy, College of Agriculture, Hagari, University of Agricultural Sciences, Raichur, Karnataka, India

Vishwanatha S
Assistant Professor of Agro meteorology, Department of Agronomy, College of Agriculture, Raichur, University of Agricultural Sciences, Raichur, Karnataka, India

Chandranaik M
Associate Professor, Department of Crop Physiology, Agricultural Research Station, Siruguppa, University of Agricultural Sciences, Raichur, Karnataka, India

Parameshnaik C
Assistant Professor, Department of Agronomy, College of Agriculture, Raichur, University of Agricultural Sciences, Raichur, Karnataka, India

Corresponding Author:
Mahammad Riyaz
M.Sc. Scholar, Department of Agronomy, College of Agriculture, Raichur, University of Agricultural Sciences, Raichur, Karnataka, India

Effect of enriched vermicompost on nutrient uptake and economics of baby corn (*Zea mays* L.)

Mahammad Riyaz, Ramesha YM, Krishnamurthy D, Vishwanatha S, Chandranaik M and Parameshnaik C

DOI: https://www.doi.org/10.33545/2618060X.2025.v8.i10a.3952

Abstract
A field experiment was conducted at Agricultural Research Station, Dhadesugur during *kharif*, 2024 to study the effect of enriched vermicompost on nutrient uptake and economics of baby corn (*Zea mays* L.). An experiment was laid in RBD design with eight treatments and replicated thrice. The results revealed that application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS recorded significantly higher nutrient uptake and maximum gross returns (₹ 2,80,410 ha^{-1}), net returns (₹ 2,10,001 ha^{-1}) and B:C (3.98). However, application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ @ 0.5% at 45 DAS and application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + foliar spray of $FeSO_4$ @ 0.5% at 45 DAS which were found on par with each other with respect to nutrient uptake and economics. Further, least nutrient uptake and economic returns were noticed in control treatment.

Keywords: Baby corn, enriched vermicompost, gross returns, nutrient uptake

Introduction
Maize (*Zea mays* L.) is emerging as the third most important cereal crop in the world after wheat and rice. It is called as "Queen of Cereals", due to high productive potential, easy to process, low cost than other cereals (Jaliya *et al.*, 2008) [3], besides serving as human food and animal feed, it has wide industrial application. Maize is classified into different groups or types based on the endosperm of kernels among which baby corn is grown for vegetable purpose. Importance of maize as vegetable is little known to the Indian farmers in spite of the fact that it fetches very lucrative price in national and international markets.

Baby corn also known as young cob, when the silks have either not emerged or just emerged and no fertilization has taken place. Baby corn is one of the most important dual-purpose crops grown round the year in India (Singh *et al.*, 2015) [10], the earliness facilitates crop diversification, increase overall cropping intensity in a year and increases profitability. Baby corn is becoming popular in domestic and foreign markets and has enormous processing and export potential. Baby corn has the good nutritive potential therefore it has got wide demand as vegetable.

Biofertilizers play a vital role in enhancing soil fertility by fixing atmospheric nitrogen, either symbiotically with plant roots or freely in the soil, solubilizing insoluble phosphates, and producing plant growth-promoting compounds. They are increasingly recommended as tools to utilize natural biological processes for nutrient mobilization. Being cost-effective, eco-friendly and renewable, biofertilizers provide a sustainable source of nutrients. In addition to nutrient supply, they enrich the soil with organic matter, thereby contributing to the prevention of soil degradation.

Azospirillum is a type of biofertilizer that contains nitrogen-fixing bacteria. These bacteria form a symbiotic relationship with plant roots, enhancing nutrient uptake and promoting plant growth. Phosphorus Solubilizing Bacteria (PSB) are important in baby corn cultivation because they increase the availability of phosphorus, a key nutrient for crop growth, which is often locked in insoluble forms in the soil. By solubilizing these phosphates, PSB enhance nutrient uptake, leading to better root development, stronger plant growth.

Most of the organic manures are very low in nutrient contents, which are not sufficient to meet the nutritional requirement of the crops, especially when inorganic fertilizers are not applied. Vermicompost not only adds microbial organisms and nutrients that have long lasting residual effects, it also modulates structure to the existing soil, increases water retention capacity. It improves the availability of air and water, thus encouraging seedling emergence and root growth.

Adding beneficial microbes along with micronutrients such as zinc (Zn) and iron (Fe) to organic manures like vermicompost, neem cake and compost, together with biofertilizers, offers greater benefits compared to using organic manures alone. This integration boosts nutrient availability by supporting nitrogen fixation, phosphate solubilization and improved absorption of Zn and Fe. Hence, the combined use of organic amendments, microbial inoculants, micronutrients and biofertilizers represents a sustainable, low-cost and environmentally friendly approach to nutrient management for enhanced crop yields.

Materials and Methods

The experiment was carried out at Agricultural Research Station, Dhadesusgur, University of Agricultural Sciences, Raichur, Karnataka. The experimental site was geographically situated in Northern Dry Zone (Zone - III) of Karnataka at a Latitude of 15º 69′ North, Longitude of 76º 89′ East with an Altitude of 358 meters above mean sea level. The soil of the experimental site was medium black to deep black with clay loam texture. Regarding chemical properties, the soil was alkaline in reaction (pH-8.13), low in EC (0.30 dS m^{-1}) and low in organic carbon content (0.40%). The soil was low in available nitrogen (274.19 kg ha^{-1}), high in available phosphorus (29.42 kg ha^{-1}) and high in available potassium (345.58 kg ha^{-1}).

The experiment was laid out in Randomized Complete Block Design (RCBD) with three replications and eight treatments comprising of different biofertilizers and micronutrients. The treatments consisting of T_1 : Control, T_2 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1}, T_3 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1}, T_4 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1}, T_5 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1}, T_6 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + Foliar spray of $ZnSO_4$ @ 0.5% at 45 DAS, T_7 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + Foliar spray of $FeSO_4$ @ 0.5% at 45 DAS and T_8 : EVC with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + Foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS.

The grain and fodder sample collected from each plot at harvest were dried in oven at 65 ºC till a constant weight. These samples were grounded in laboratory mill, passed through 40 mm mesh sieve and used for estimating of N, P, K, Zn and Fe contents. Total nitrogen was determined by Kjeldahl's method, Phosphorus was estimated by Vanadomolybdate method, Potassium was estimated by Flame Photometer method, Zn and Fe content was estimated by using Atomic Absorption Spectrophotometer (AAS) with zinc and iron hallow cathode lamps as described by Jackson (1973). The economics was worked out based on the prevailing market price for the existing year. Data analysis and interpretation was done using Fisher's method of analysis of variance (ANOVA) technique as given by Panse and Sukhatme (1967) [7].

Results and Discussion

Nutrient uptake

Nitrogen

Among all the treatments, significantly lower uptake of nitrogen by cob, stover and total uptake was recorded in control treatment (47.3, 74.4 and 121.7 kg ha^{-1}, respectively). Application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS recorded significantly higher uptake of nitrogen by cob, stover and total uptake (58.9, 91.8 and 150.7 kg ha^{-1}, respectively). Further, application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ @ 0.5% at 45 DAS (57.0, 88.3 and 145.2 kg ha^{-1}, respectively) and application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + foliar spray of $FeSO_4$ @ 0.5% at 45 DAS (56.4, 87.4 and 143.8 kg ha^{-1}, respectively) were on par with each other.

The significant increase in nitrogen uptake can be ascribed to the synergistic effect of organic and microbial sources that enhance nitrogen availability, uptake and assimilation in baby corn plants. *Azospirillum,* a well-documented diazotroph, is known to fix atmospheric nitrogen and stimulate root development through phytohormone production, thereby facilitating greater nutrient absorption. PSB further supports improved nutrient mobilization by solubilizing bound forms of phosphorus, indirectly enhancing nitrogen use efficiency by promoting vigorous plant growth. The foliar spray at 45 DAS likely supplemented immediate nutrient needs during the peak vegetative phase, contributing to enhanced translocation and partitioning of nitrogen within plant organs. These findings are consistent with those reported by Arthy *et al.* (2020) [1] and Mahato *et al.* (2020) [6] in maize and Jat *et al.* (2021) [4] in barley.

Phosphorus

Significantly higher phosphorus uptake by cob, stover and total uptake was noticed in treatment with the application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS (9.0, 20.9 and 29.9 kg ha^{-1}, respectively). The control treatment recorded significantly lower phosphorus uptake by cob, stover and total uptake (6.28, 16.7 and 22.6 kg ha^{-1}, respectively). However, application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ @ 0.5% at 45 DAS (8.53, 20.0 and 28.6 kg ha^{-1}, respectively) and application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + foliar spray of $FeSO_4$ @ 0.5% at 45 DAS (8.35, 19.8 and 28.2 kg ha^{-1}, respectively) were on par with each other.

The enhanced phosphorus uptake can be attributed primarily to the presence of phosphorus solubilizing bacteria (PSB), which convert insoluble forms of phosphorus in the soil into plant-available forms through the secretion of organic acids and phosphatases. This microbial activity, combined with the nutrient buffering capacity of vermicompost, likely improved phosphorus mobility and uptake by the plant roots. Moreover, *Azospirillum*, although primarily a nitrogen fixer, is also known to enhance root proliferation and surface area, indirectly promoting greater phosphorus absorption. The additional application of $FeSO_4$ and $ZnSO_4$, particularly as a foliar spray at the critical mid-growth stage, could have played a supportive role in optimizing metabolic functions that depend on phosphorus, such as ATP formation and energy transfer, thereby improving its assimilation and distribution in plant tissues. These observations corroborate the findings of Shahin *et al*. (2022) [8] in sweet corn and Sofyan *et al*. (2019) [11] in maize.

Potassium
With respect to potassium uptake, control treatment was noticed with lower potassium uptake by cob, stover and total uptake (50.2, 160.0 and 214.2 kg ha^{-1}, respectively). Significantly higher potassium uptake by cob, stover and total uptake was recorded in the treatment receiving vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS (62.7, 195.0 and 257.7 kg ha^{-1}, respectively). While, application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ @ 0.5% at 45 DAS (60.5, 188.2 and 248.7 kg ha^{-1}, respectively) and application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + foliar spray of $FeSO_4$ @ 0.5% at 45 DAS (59.8, 187.0 and 246.8 kg ha^{-1}, respectively) were found to be on par with each other.

The improvement in potassium uptake under enriched organic and microbial nutrient management can be attributed to several synergistic factors. Vermicompost serves as a slow-release source of nutrients and enhances soil microbial activity, leading to better cation exchange capacity and improved potassium availability. Additionally, inoculation with *Azospirillum* and PSB may have stimulated root growth and increased rhizosphere activity, thereby facilitating better nutrient absorption. Potassium, being a highly mobile regulation, enzyme activation and translocation of assimilates. Similar enhancements in potassium uptake have been reported by Khan Mohammadi *et al.* (2017) [5] and Mahato *et al*. (2020) [6] in maize.

Zinc
Among the treatments, application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS recorded the maximum zinc uptake by cob, stover and total uptake (49.4, 183.5 and 232.9 g ha^{-1}, respectively). On the other hand, the lower uptake was observed under the control treatment for cob, stover and total uptake of zinc (27.6, 95.8 and 123.4 g ha^{-1}, respectively).

Enhanced zinc accumulation in the plants receiving enriched vermicompost and biofertilizers may be attributed to the improved micronutrient solubilization and availability in the rhizosphere. Vermicompost, being rich in humic substances and microbial populations, plays a pivotal role in chelating zinc and maintaining it in plant-available forms. The inclusion of $ZnSO_4$ in the basal application and its supplemental foliar spray ensured both immediate and sustained zinc availability during critical growth stages.

Iron
With respect to iron uptake, control treatment was noticed with lower iron uptake by cob, stover and total uptake (39.3, 144.3 and 183.6 g ha^{-1}, respectively). Significantly higher iron uptake by cob, stover and total uptake was recorded in the treatment receiving vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS (65.7, 249.6 and 315.3 g ha^{-1}, respectively).

The markedly greater iron accumulation may be ascribed to the synergistic effect of organic matter, beneficial microbes and iron supplementation. Vermicompost enhances soil microbial activity and chelation of micronutrients, thereby improving iron solubility and mobility in the rhizosphere. The inoculation with *Azospirillum* and PSB likely contributed to an enhanced root architecture and rhizospheric nutrient transformation processes, facilitating better absorption of micronutrients like iron. Moreover, the application of $FeSO_4$ through foliar routes ensured continuous iron availability during peak plant demand. Foliar feeding at 45 DAS might have directly contributed to enhanced translocation of iron into vegetative and reproductive structures.

Economics
Cost of cultivation (₹ ha^{-1})
Numerically higher cost of cultivation was incurred in the treatment with the application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + Foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS (₹ 70,409 ha^{-1}). However, lower cost of cultivation was observed with control (₹ 64,709 ha^{-1}).

The increased in cultivation cost under the enriched vermicompost treatment was primarily due to the inclusion of multiple input components, such as biofertilizers (*Azospirillum*, PSB), inorganic micronutrient sources ($FeSO_4$ and $ZnSO_4$) and the labour involved in foliar spray operations. These combined factors contributed to a substantial rise in the overall production cost compared to untreated control plots.

Gross returns and net returns (₹ ha^{-1})
Significantly higher gross returns and net returns were recorded with the application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + Foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS (₹ 2,80,410 ha^{-1} and 2,10,001 ha^{-1}, respectively). Significantly lower gross returns and net returns were recorded with control (₹ 2,15,410 ha^{-1} and 1,50,701 ha^{-1}, respectively).

Higher gross returns and net returns can be attributed to the enhanced productivity of both green cob and green fodder yield as a result of integrated nutrient supplementation. The synergistic effects of enriched vermicompost and micronutrient foliar sprays improved crop performance, translating into greater marketable produce and subsequently, higher financial gains.

Benefit cost ratio (B:C)
Higher BC ratio was observed with the application of vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + Foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS (3.98). The lower BC ratio was found with control (3.33).

Despite higher input costs, the marked increase in yield and returns enhanced the profitability per unit cost invested. The combined use of enriched vermicompost and biofertilizers, coupled with critical stage foliar micronutrient sprays, likely improved nutrient availability, uptake and physiological efficiency, resulting in better economic output. Similar results were observed by Sharma *et al*. (2020) [9] in maize, Thamatam and Mehera (2022) [12] in sweet corn.

Table 1: Nitrogen, Phosphorus and Potassium uptake by baby corn as influenced by the application of vermicompost enriched with biofertilizers and micronutrients

Treatments	N Uptake (kg ha^{-1})			P Uptake (kg ha^{-1})			K Uptake (kg ha^{-1})		
	Cob	Stover	Total	Cob	Stover	Total	Cob	Stover	Total
T_1	47.3	74.4	121.7	6.28	16.7	22.6	50.2	160.0	214.2
T_2	49.4	77.1	126.5	6.64	17.3	23.9	52.1	167.2	219.4
T_3	52.6	81.3	133.9	7.44	18.3	25.8	55.5	173.6	230.7
T_4	52.1	80.7	132.8	7.15	18.2	25.3	55.0	173.2	229.5
T_5	54.4	83.9	138.4	7.91	19.0	26.9	57.6	180.2	237.9
T_6	57.0	88.3	145.2	8.53	20.0	28.6	60.5	188.2	248.7
T_7	56.4	87.4	143.8	8.35	19.8	28.2	59.8	187.0	246.8
T_8	58.9	91.8	150.7	9.00	20.9	29.9	62.7	195.0	257.7
S.Em. ±	0.60	0.84	1.71	0.10	0.15	0.34	0.56	2.01	2.84
C.D. (P=0.05)	1.82	2.52	5.14	0.30	0.45	1.02	1.68	5.92	8.52

Note: RDF: (150:75:40 - N: P_2O_5: K_2O kg ha^{-1}) is common for all the treatments
EVC- Enriched vermicompost, PSB- Phosphate solubilizing bacteria, DAS- Days after sowing, NS- Non significant

Table 2: Zinc and iron uptake by baby corn as influenced by the application of vermicompost enriched with biofertilizers and micronutrients

Treatments	Zn Uptake (g ha^{-1})			Fe Uptake (g ha^{-1})		
	Cob	Stover	Total	Cob	Stover	Total
T_1	27.6	95.8	123.4	39.3	144.3	183.6
T_2	34.1	132.9	167.0	49.7	185.7	235.4
T_3	39.7	148.7	188.4	49.6	188.5	238.1
T_4	34.4	137.4	171.8	54.6	208.7	263.3
T_5	40.9	151.8	192.7	54.8	210.3	265.1
T_6	45.4	167.8	213.1	49.6	190.1	239.7
T_7	36.8	138.2	175.1	60.4	229.5	289.9
T_8	49.4	183.5	232.9	65.7	249.6	315.3
S.Em. ±	0.9	3.4	4.2	1.6	5.8	6.9
C.D. (P=0.05)	2.8	10.2	12.6	4.5	17.3	21.1

Note: RDF: (150:75:40 - N: P_2O_5: K_2O kg ha^{-1}) is common for all the treatments
EVC- Enriched vermicompost, PSB- Phosphate solubilizing bacteria, DAS- Days after sowing, NS- Non significant

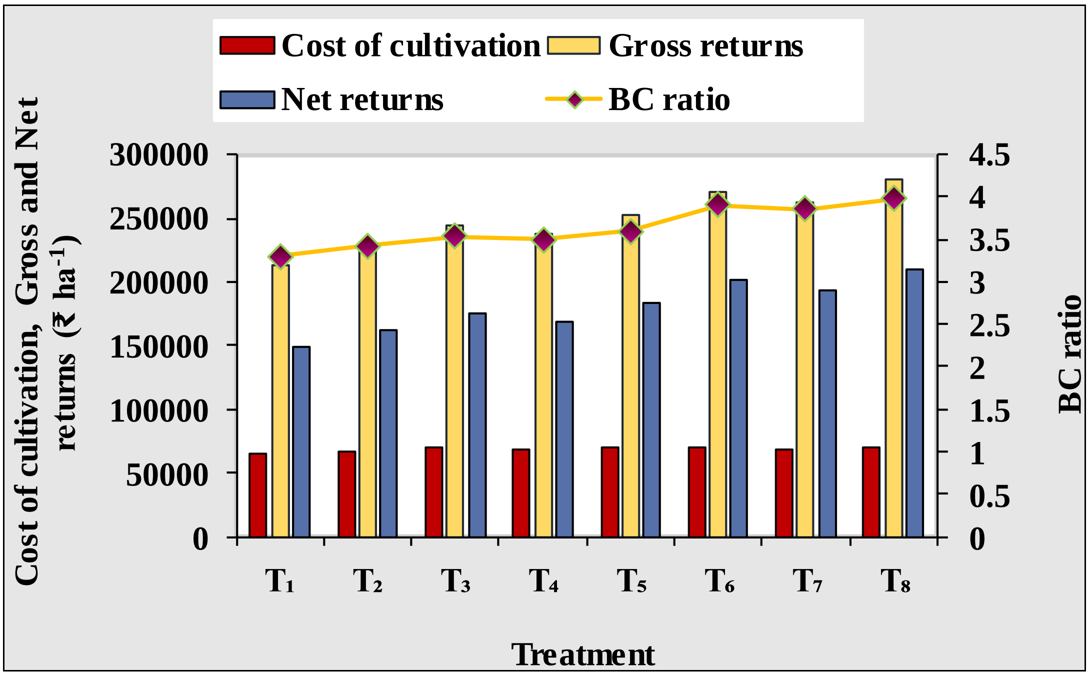

Fig 1: Economics of baby corn as influenced by the application of vermicompost enriched with biofertilizers and micronutrients

Conclusion

The treatment received vermicompost enriched with *Azospirillum* @ 10 kg ha^{-1} + PSB @ 10 kg ha^{-1} + $FeSO_4$ @ 10 kg ha^{-1} + $ZnSO_4$ @ 25 kg ha^{-1} + foliar spray of $ZnSO_4$ and $FeSO_4$ @ 0.5% at 45 DAS recorded significantly higher nutrient uptake and maximum gross returns, net returns and B:C over the rest of the treatments. Further, control treatment recorded significantly lower nutrient uptake.

Acknowledgement

This research was a part of M. Sc. thesis and the author greatly appreciate research facilities and support provided by Farm superintendent, ARS, Dhadesugur, UAS, Raichur.

References

1. Arthy M, Kandasamy S, Kalaiyarasan C. Effect of nutrient management practices on yield and nutrient uptake in maize

(*Zea mays* L.). Plant Arch. 2020;20(1):2005-6.
2. Jackson ML. Soil chemical analysis. New Delhi: Prentice Hall of India Pvt. Ltd.; 1973. p. 498.
3. Jaliya MM, Falaki AM, Mahmud M, Abubakar LU, Sani YA. Response of quality protein maize (QPM) (*Zea mays* L.) to sowing date and NPK fertilizer rate on yield and yield components. J Agric. 2008;3(2):24-35.
4. Jat ML, Chaplot PC, Choudhary J, BC D, Meema RL. Effect of organic, inorganic and biofertilizer on nutrient content, uptake and nutrient status of soil in barley (*Hordeum vulgare* L.). Pharma Innov J. 2021;10(12):301-7.
5. Khan Mohammadi N, Pankhaniya RM, Joshi MP, Patel KM. Influence of inorganic fertilizer, vermicompost and biofertilizer on yield & economics of sweet corn and nutrient status in soil. IJAR. 2017;3(5):183-6.
6. Mahato M, Biswas S, Dutta D. Effect of integrated nutrient management on growth, yield and economics of hybrid maize (*Zea mays* L.). Curr J Sci Technol. 2020;39(3):78-86.
7. Panse VG, Sukhatme PV. Statistical methods for agricultural workers. New Delhi: ICAR; 1967. p. 359.
8. Shahin SK, Rao MS, Rao AU, Gurumurthy P, Basu BJ. Performance of sweet corn under various nutrient management practices. Biochem Cell Arch. 2022;22(2):4355-9.
9. Sharma V, Singh MJ, Khokhar AK. Productivity, nutrient uptake and soil properties as influenced by integrated nutrient management in maize-wheat cropping system under rainfed conditions of sub-montane Punjab. Agric Res J. 2020;57(6):839-47.
10. Singh AK, Kumar R, Bohra JS, Kumawat N. Fodder yield, nutrient uptake and quality of baby corn (*Zea mays* L.) as influenced by NPKS and Zn fertilisation. Res Crops. 2015;16(2):243-9.
11. Sofyan ET, Sara DS, Machfud Y. The effect of organic and inorganic fertilizer applications on N, P-uptake, K-uptake and yield of sweet corn (*Zea mays saccharata* Sturt). Earth Environ Sci. 2019;393(1):012-21.
12. Thamatam S, Mehera B. Effect of biofertilizers and zinc on growth and yield of sweet corn. Pharma Innov J. 2022;11(4):1255-7.