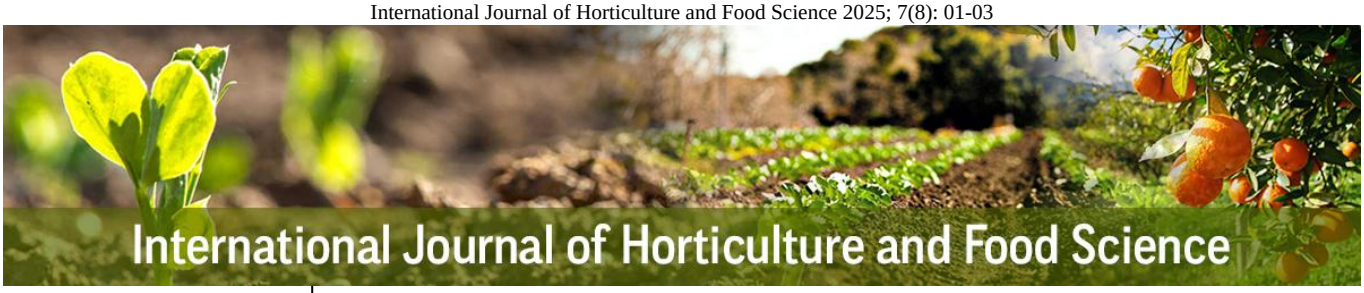

E-ISSN: 2663-1067
P-ISSN: 2663-1075
NAAS Rating (2025): 4.74
www.hortijournal.com
IJHFS 2025; 7(8): 01-03
Received: 02-05-2025
Accepted: 05-06-2025

Sourabh Singh
Research Scholar, Department of Agriculture (Horticulture), Faculty of Agriculture and Veterinary Science, Mewar University, Chittorgarh, Rajasthan, India

Om Prakash Regar
Assistant Professor, Department of Agriculture, Faculty of Agriculture and Veterinary Science, Mewar University, Chittorgarh, Rajasthan, India

Bhagwan Suman
Assistant Professor, Department of Agriculture, Faculty of Agriculture and Veterinary Science, Mewar University, Chittorgarh, Rajasthan, India

Brijesh Kumar Meena
Assistant Professor, Department of Agriculture, Faculty of Agriculture and Veterinary Science, Mewar University, Chittorgarh, Rajasthan, India

Champa Lal Regar
Assistant Professor, Department of Agriculture, Faculty of Agriculture and Veterinary Science, Mewar University, Chittorgarh, Rajasthan, India

Corresponding Author:
Sourabh Singh
Research Scholar, Department of Agriculture (Horticulture), Faculty of Agriculture and Veterinary Science, Mewar University, Chittorgarh, Rajasthan, India

Response of organic nutrient management in bottle gourd [*Lagenaria siceraria* (Mol) Standl.]

Sourabh Singh, Om Prakash Regar, Bhagwan Suman, Brijesh Kumar Meena and Champa Lal Regar

DOI: https://www.doi.org/10.33545/26631067.2025.v7.i8a.357

Abstract
A field experiment was conducted at Research Farm of Mewar University, Chittorgarh (Rajasthan) during *Summer* season, 2025 on loamy sand soil, which consisted nine treatments *viz*., control T1: Control, T2: 100% Vermicompost (5 t/ha), T3: 100% Compost (5 t/ha), T4: Phosphate Solubilizing Bacteria (PSB) (25 g/kg seed), T5: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha), T6: 50% Vermicompost (2.5 t/ha) + PSB (25 g/kg seed), T7: 50% Compost (2.5 t/ha) + PSB (25 g/kg seed), T8: 50% Compost (2.5 t/ha) + 25% Vermicompost (1.5 t/ha) and T9: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha) + PSB (25 g/kg seed) randomized block design (RBD). The bottle gourd variety "Pusa Naveen" was used for experiment.
Results clearly showed that growth parameters *viz*., vine length (527.40 cm) at harvest and 1st appearance of female flowers (35.75) and whereas yield parameters and yields *viz*., maximum yield parameters *viz*. fruit length (30.22), fruit weight (970.08), number of fruits/plant (18.59 kg) and yield (250.89 q/ha) significantly higher recorded under T9: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha) + PSB (25 g/kg seed) over control. Further it was recorded that T6 and T5 where as T8, T2 statistically at par with each other.

Keywords: Bottle gourd, FYM, organic nutrient, vine length and yields

1. Introduction
Cucurbitaceae family is a largest group of vegetables crops which provide the major contribution for economically important domesticated species and are cultivated form medicinal and nutritional value. Among all plants of the Cucurbitaceae family, *Lagenaria* species is one of the most popular cucurbits. Bottle gourd belongs to the genus *Lagenaria* that is derived from the word *lagena*, meaning 'the bottle'. It seems that bottle gourd was originated from India because its wild races are found in Dehradoon (high humid area and Malabar coastal area). Bottlegourd [*Lagenaria siceraria* (Mol.) Standl.)] is one of the most popular cucurbitaceous crops grown in India and entire world.
The bottle gourd is monoecious and there is highly variable range in the male to female sex ratio. The production of staminate flower is normally much more than pistillate flowers. However, ultimately only pistillate flowers contribute to the yield in the crop. So, it is highly important to achieve a shift in favour of pistillate flowers in bottle gourd crop. Consumption of bottle gourd has been associated with a number of functional properties and health benefits: anti-hyper-lipidemic activity, analgesic and anti- inflammatory activity, diuretic activity, anti-oxidant activity, immuno-modulatory activity, hepato-protective activity, cardio- protective activity, anti-diabetic activity, central nervous system activity, hypertensive activity, anticancer activity, CNS depressant activity (Sharma *et al*., 2022) [4].
Nutrient management plays an important role in boosting up the yield of vegetable crops. Integrated use of organic manure, inorganic fertilizers and biofertilizers, as a source of plant nutrients helps in building up soil health and productivity of crops. It helps in improving soil physical and biological properties. It supplies the various nutrients required by the plant in a balanced form and avoids ill effects on soil health, those associated with the use of inorganic fertilizers. Thus, this system supplies all the nutrients judiciously to increase yield in a sustainable way. Hence, the integrated approach of plant nutrient supply is indispensable for sustaining the production potential of vegetable crops.

Organic nutrient management plays a vital role in enhancing the growth, yield, and quality of bottle gourd (*Lagenaria siceraria*) by improving soil health and fertility. Application of organic sources such as FYM, vermicompost, compost, and biofertilizers enriches the soil with essential nutrients and beneficial microbes, leading to better nutrient availability and uptake.

Farmyard manure (FYM) is the traditional organic manure and is most readily available to the farmers. The Vermicompost is a nutritive organic fertilizer enriched microbiologically-active peat-like material and is commonly used for management of organic wastes by decomposition and humifiction of biodegradable organic wastes carried out by microbes present in the soil and gut of earthworms. Compost is a nutrient-rich organic amendment produced through the aerobic decomposition of organic matter, such as crop residues, kitchen waste, animal manure, and plant biomass, by microorganisms under controlled conditions. Phosphorus Solubilizing Bacteria (PSB) are a group of beneficial soil microorganisms capable of converting insoluble forms of phosphorus (P) into forms available to plants through processes like acidification, chelation, and enzymatic solubilization.

Materials and Methods

The field experiments were carried out during *summer* season (2025) to study the "Response of Organic Nutrient Management in Bottle Gourd [*Lagenaria siceraria* (Mol) Standl.]" in randomized block design (FRBD) with consisted nine treatments *viz*., control T1: Control, T2: 100% Vermicompost (5 t/ha), T3: 100% Compost (5 t/ha), T4: Phosphate Solubilizing Bacteria (PSB) (25 g/kg seed), T5: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha), T6: 50% Vermicompost (2.5 t/ha) + PSB (25 g/kg seed), T7: 50% Compost (2.5 t/ha) + PSB (25 g/kg seed), T8: 50% Compost (2.5 t/ha) + 25% Vermicompost (1.5 t/ha) and T9: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha) + PSB (25 g/kg seed) at Research Farm, Mewar University, Chittorgarh (Rajasthan). The experimental farm is geographically located at 074o63'59" E longitude and 25o0'33" N latitude and this region falls under agro-climatic zone IV A of Rajasthan. The experimental fields were clay loam and the soil fertility status contained available nitrogen (137.8 kg ha-1) by Subia and Asija 1996, available phosphorus (16.3 kg ha-1) by Olsen *et al*. 1954 and available potassium (250.12 kg ha-1). The organic carbon content was from 0.34-0.38 per cent. The weekly mean maximum and minimum temperatures were of temperature during both summers (40.6º C) and winters (2.7º C). The mean relative humidity fluctuated from 63.50 to 91 per cent during the crop season. The average rainfall is 557 mm per annum, which is mostly received during july to September. The sporadic showers during winters are also common, which are probably observed during this period. The observation were recorded at harvest was analysed by statistical methods (Fisher, R.A. 1950).

Results and Discussion

It is clear from the result of present study that, organic nutrient management had significantly affected the growth and yield parameters of bottle gourd at harvest. Application of T9: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha) + PSB (25 g/kg seed) recorded the highest growth parameters *viz*. vine length (527.40 cm) at harvest and 1st appearance of female flowers (35.75) which was superior over control. However; T6 and T5 where as T8, T2 statistically at par with each other (Table-1). Vine length and 1st appearance of female flowers increased with the application of organic sources of nutrients due to increased cell division and cell elongation at higher level of nutrients. Probably the increase in auxin supply with higher levels of nitrogen brought about increase in the dry matter and branches per plant.

The observed improvement might be due to an early and plentiful availability of nutrients leading to better nutritional environment in the root zone for growth and development. As nitrogen is one of the major essential plant nutrients required for growth (Budige *et al*., 2021 and Somvanshi *et al*., 2024) [1, 6]. It is obvious that phosphorus and potassium has long been considered as an essential constituent of all living organism, which plays an important role in conservation and transfer of energy in metabolic reactions of living cells including biological energy transformations. Phosphorus not only plays an important role in root development and proliferation but also improves water uptake by supplying assimilates to the roots. It is the main constituent of co-enzymes, ATP and ADP which act as "energy currency" within plants. Almost every metabolic reaction of any significance proceeds *viz*., phosphate derivatives. Thus, phosphorus influenced photosynthesis, biosynthesis of protein and phospholipids, nucleic acid synthesis, membrane transport and cytoplasmic streaming. Similar results were reported by Sharma *et al*., 2014 [3] and Sebastian *et al*., 2024) [2].

Further yield parameters and yields like fruit length (30.22 cm), fruit weight (970.08 g), number of fruits/plant (18.59 kg) and yield (250.89 q/ha) presented in table 2, recorded with the application of T9: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha) + PSB (25 g/kg seed) over control but it was remained statistically at par with T6 and T5 where as T8, T2 statistically at par with each other. Yield components by enhancing cell division, cell elongation process and photosynthetic activity leading to production and accumulation of more carbohydrates and auxins which favours retention of more flowers ultimately leading to more number of reproductive parts plant-1 (Sinha *et al*., 2023 and Thakur *et al*. 2024.) [5 8].

Table 1: Response of organic nutrient management on growth parameters of bottle gourd

Treatment	Vine length (cm)	Appearance of 1st female flower (days)
T1	227.33	60.06
T2	391.77	52.57
T3	340.03	55.50
T4	283.28	56.04
T5	466.73	44.40
T6	478.52	40.63
T7	415.02	48.51
T8	405.65	49.90
T9	527.40	35.75
S.Em+	13.06	1.07
CD (P=0.05)	40.07	3.21
CV (%)	6.02	6.23

Table 2: Response of organic nutrient management on yield parameters and yields of bottle gourd

Treatment	Fruit length (cm)	Fruit weight (g)	Number of fruits/plant	Yield (q/ha)
T1	19.55	370.51	10.09	149.87
T2	24.93	710.25	14.25	202.08
T3	23.44	596.31	12.88	198.85
T4	21.88	490.22	11.53	190.67
T5	28.93	927.34	16.46	234.73
T6	30.15	965.14	16.83	235.94
T7	26.52	881.59	16.07	220.09
T8	25.01	776.79	14.53	206.93
T9	30.22	970.08	18.59	250.89
SEm±	0.36	34.20	0.34	3.68
CD (P=0.05)	1.05	102.76	1.045	10.02
CV (%)	6.65	7.92	10.09	8.76

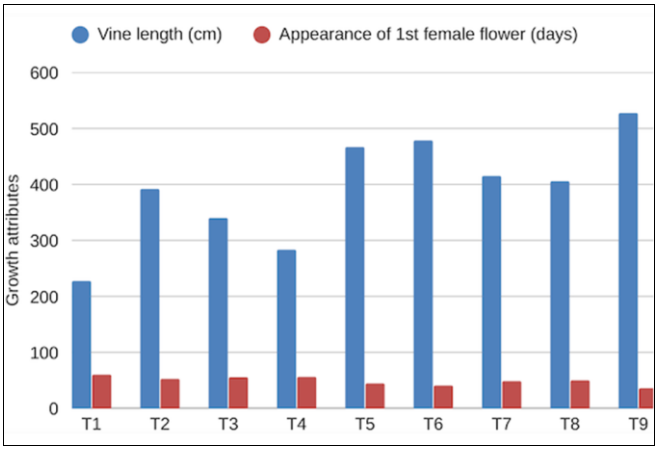

Fig 1: Response of organic nutrient management on growth parameters of bottle guard

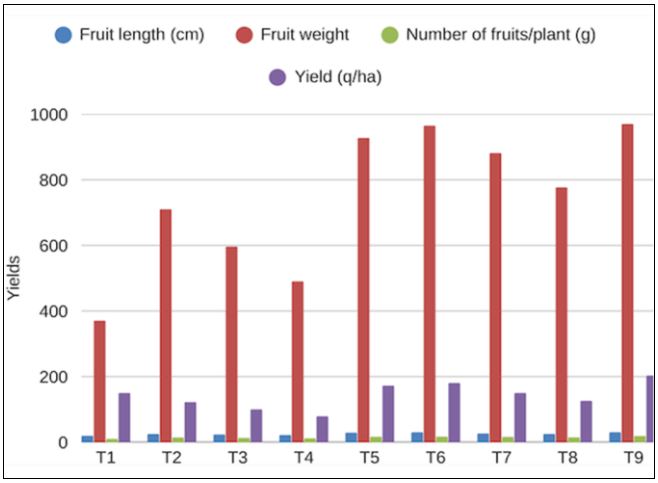

Fig 2: Response of organic nutrient management on yield parameters and yields of bottle gourd

Conclusion

Based on the results of one year experimentation, it may be concluded that the Application of T9: 50% Vermicompost (2.5 t/ha) + 50% Compost (2.5 t/ha) + PSB (25 g/kg seed) found suitable to produce good yield of bottle gourd.

Acknowledgments

A feeling of sincere and heartfelt gratitude envelops me as I draft this acknowledgement. I acknowledge my esteemed Major Advisor, advisory committee, Head, Department of Agriculture (Horticulture), faculty members and non-teaching staff of Department of Agriculture (Horticulture), Mewar University, Chittorgarh for providing me the necessary help and suggestions during the course of the study.

References

1. Budige K, Sanodiya L, Swetha P, Anumandla A. Impact of Nitrogen Levels and Application of Boron on Yield and Growth of Greengram (*Vigna radiata* L.). Biological Forum. 2021;13(3):08-11.
2. Sebastian R, Singh RP, Yadav KK. Effect of controlled release fertilizer on growth of bottle gourd under Prayagraj agro-climatic conditions. The Pharma Innovation Journal. 2021;10(11):1226-1230.
3. Sharma A, Dixit AK, Singh AK, Jadhav S. Vermicompost and its impact on soil fertility and productivity. Green Farming. 2014;5(6):940-943.
4. Sharma R, Patel ML, Jain S. Effect of organic nutrient sources on cucumber growth and yield. Journal of Horticultural Research. 2022;30(4):66-71.
5. Sinha R, Das K, Prasad R. Response of pumpkin (*Cucurbita moschata*) to integrated organic nutrient management. International Journal of Agriculture Sciences. 2023;15(2):123-126.
6. Somvanshi S, Victor D, Himanshu S. Effect of bio-fertilizer and phosphorus on growth and yield of cowpea. International Journal of Research in Agronomy. 2024;7(7):399-404.
7. Subbiah BV, Asija GL. A rapid procedure for estimation of available nitrogen in soils. Current Science. 1956;25:259-260.
8. Thakur P, Chandel RK, Sharma A. Growth behavior of cucumber under organic input management. Journal of AgriSearch. 2024;11(1):88-93.