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Influence of different organic manures on growth and yield of groundnut (*Arachis hypogaea* L.)

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Abstract

The experiment was conducted at Crop Research Cafeteria, School of Agricultural sciences, G.H. Raisoni University, Chhindwara (M.P.). The experiment was laid out in Randomized Block Design (RBD) with six treatments and three replications. The treatment detail is T₁ 100% FYM, T₂ 100% Vermicompost, T₃ 100% Poultry manure, T₄ 50% FYM + 50% Vermi-compost, T₅ 50% FYM + 50% Poultry manure and T₆ Control. Integrated use of different organic source for nutrition showed a significant impact on the yield and economics of groundnut. The results revealed that the application of T₃ 100% Poultry manure showed a significant positive impact on seed yield (Kg ha⁻¹), straw (Kg ha⁻¹) and gross monetary return, net return and B: C ratio.

Keywords: Groundnut, organic manures, yield and economics

Introduction

Groundnut (*Arachis hypogaea* L.) is family Leguminosae is that the “King of oilseed” in our country is a very important crop each for oil and food crop of tropical and semi-arid tropical countries, wherever it provides a serious supply of edible oil and vegetable super molecule. Groundnut has the primary place among all the seed crops in the Republic of India accounting for quite forty % surface area and sixty % production within the country. The Republic of India ranks initial in space of eight. 4 million hectares causative eight.4 million tonnes production of groundnut (Tank *et al.*, 2006) [8]. In India out of total production of edible oil, 67 per cent is contributed by groundnut. The demand for edible oil in the country is rising by 6 per cent per annum. Therefore, concerted efforts are now being made for increasing and stabilizing oilseed production.

Organic agriculture is a type of farming that has the potential to reduce environmental degradation while also ensuring ecosystem services as well as agricultural sustainability (Maitra *et al.*, 2020) [3]. Organic sources of nutrients include bulky organic manures and concentrated organic manures; however nutrients are not available in optimal quantities for high-nutrient-demanding crops like groundnut (Patel 2018) [4]. In the current context (Maitra *et al* 2020) [3], people's choice for chemical-free food is growing, making it a challenging task to increase crop yield in a sustained and high-quality manner. Furthermore, increased production regardless of soil health or environmental conditions is not advisable; hence agriculture must prioritise sustainability (Singh and Singh, 2002) [7]. A plant's nutritional demand cannot be met by a single resource. Taking all of this into account, combined and careful application improves soil quality and provides long-term crop productivity. Integrated application of FYM (5t/ha) and specified fertilizer dose is advised for improved and early crop growth and yield (Patil *et al.*, 2017) [5].

Organic manure is found to increase the groundnut productivity with maintaining soil health. Among those, Vermicompost acts as a primary provider of essential macro and micro nutrients in chelated form, meeting the crop's balancing the nutrient requirements over an extended duration. Concurrently, poultry manure represents another vital nutrient source, actively promoting plant growth. Importance of FYM in crop production and soil fertility management is well known.

Materials and Methods

The present research entitled “Influence of different organic manures on growth and yield of groundnut (*Arachis hypogaea* L.)” has been conducted in the during *Rabi* season of 2022 at the Crop Research Cafeteria, School of Agricultural sciences, G.H. Rasoni University, Chhindwara (M.P.). The details of materials used in the experimentation, and the techniques adopted during the course of investigation are described in this chapter. The details of observation taken in the field as well as in the chemical determination performed in the laboratories are also presented. Location and the Meteorological climate data, which includes factors like maximum and minimum temperatures, mean relative humidity, and rainfall and evaporation during the period of experimentation were recorded at the meteorological observatory, GH Rasoni University, during the crop growth period from 5st Nov, 2022 to 31st March 2023 the data reveals that season witnessed a rainfall of 59.00 mm during the crop growth period during *Rabi* 2022. Soil characteristics of experimental field. The topography of field was uniform and gentle slope with adequate drainage facilities. The soil sample was taken randomly from the experimental field before sowing of a crop at the depth of 15 cm. These are samples were mixed together and a composite soil sample was drawn for chemical analysis.

Results and Discussion

The results aquired from the current research study as well as relevant discussion have been summarized under following heads

Effect on yield characters

The conspicuous from the data given in the table 1 that indicates the seed yield (kg ha⁻¹), Stover yield (kg ha⁻¹) and Harvest index (%) of groundnut has deviated significantly due in various treatments. The significantly highest kernel yield (2217 kg ha⁻¹), Stover yield (3902 kg ha⁻¹) and harvest index (41.61%) was obtained under the treatment T₃ (100% Poultry manure) followed by the treatment other treatments. These report confirm the findings of the Abraham *et al.* (2008), Salke *et al.* (2011) [6], Kamdi TS (2014) [2], Patil *et al.*, (2017) [5], Vadthe and Umesha C (2022) [9].

Table 1: Effect of different organic sources of nutrients on seed, Stover yield and harvest index of groundnut

T. No	Treatments	Seed yield (kg ha ⁻¹)	Stover yield (kg ha ⁻¹)	Harvest Index (%)
T ₁	100% FYM	1738	3059	40.33
T ₂	100% Vermicompost	2045	3600	40.37
T ₃	100% Poultry manure	2217	3902	41.61
T ₄	50% FYM + 50% Vermicompost	1829	3220	40.28
T ₅	50% FYM + 50% Poultry manure	1916	3373	40.26
T ₆	Control	1130	1989	39.95
	SEM±	48	84	1.15
	CD (P=0.05)	153	269	NS

Effect on economics

The figure of economic analysis of different treatments *viz.*, Cost of Cultivation, Gross Monetary Returns, Net Monetary Returns and benefit-cost ratio (profitability per rupee of

investment) are given in Table 2. The economic analysis influenced due to different treatments is presented under different heads.

The net monetary return (NMR) for each treatment was calculated by deducting the cultivation expenses from the gross monetary returns (GMR) generated by that specific treatment. Certainly, it's evident from the data that the NMR hit its lowest value, amounting to Rs. 13,200 per hectare, when the crop was devoid of nutrient treatment. However, it was increased with application of different treatments. The NMR was maximum (Rs. 56680 ha⁻¹) under T₃ (100% Poultry manure) followed by T₂, T₅ and rest of treatments.

This phrase describes the "Return on Investment (ROI) for a specific treatment, indicating the net monetary gain achieved for each rupee invested". It is evident from the data that B: C ratio was lowest (1.41) under T₆ (control plots) and maximum under T₃ (100% Poultry manure) (2.77) followed by T₂, T₅ and other remaining treatments. The results are well supported to the conclusion of Maitra *et al.*, (2020) [3].

Table 2: Effect of different organic sources of nutrients on economics of different treatments under groundnut cultivation

T. No	Treatments	Cost of Cultivation	Gross Returns	Net Returns	B:C
		Rs./ha			
T ₁	100% FYM	32000	69520	37520	2.17
T ₂	100% Vermicompost	32000	81800	49800	2.56
T ₃	100% Poultry manure	32000	88680	56680	2.77
T ₄	50% FYM + 50% Vermicompost	32000	73160	41160	2.29
T ₅	50% FYM + 50% Poultry manure	32000	76640	44640	2.40
T ₆	Control	32000	45200	13200	1.41

Conclusion

After analyzing the outcomes of a year-long experiment, the conclusion drawn was that maximum higher yield and benefit cost ratio of the groundnut crop with the application of 100% Poultry manure in Chhindwara region of Madhya Pradesh.

References

1. Abraham T, Thenua OVS, Singh SP, Jacob P. Performance of groundnut as influenced by organic and inorganic sources of nutrients and their method of application. *Legume Res.* 2008;31(3):224-226.
2. Kamdi TS, Sonkamble P, Joshi S. Effect of organic manure and biofertilizers on seed quality of groundnut (*Arachis hypogaea* L.) *The Bios Cane.* 2014;9(3):1011-1013.
3. Maitra S, Shankar T, Gaikwad DJ, Palai JB, Saga L. Organic agriculture, ecosystem services and Sustainability: A Review. *International Journal of Modern Agriculture.* 2020;9(4): 370-378.
4. Patel AM. Organic nutrient management packages of green manuring potato groundnut sequence. *International Journal of Agriculture Sciences;* c2018. p. 0975-3710.
5. Patil DB, Pawar PP, Wadile SC, Patil H. Effect of Integrated Nutrient Management on Growth and Yield of kharif Groundnut (*Arachis hypogaea* L.). *International Journal of Horticulture, Agriculture and Food science,* 2017;1(1):21-23.

6. Salke SR, Shaikh AA, Dalavi ND. Influence of phosphatic fertilizer, gypsum and sulphur on yield contributing characters and yield of groundnut (*Arachis Hypogaea* L.). Intern. J of Agric. Sci. 2011;7(1):221-223.
7. Singh B, Singh Y. Concepts in nutrient management. Recent Advances in Agronomy. Indian Soc. Agron., New Delhi; c2002. p. 92-109.
8. Tank DA, Meisheri TG, Usadadia VP. Integrated nutrient management in summer groundnut. Crop Res. 2006;31(1):61-62.
9. Vadthe Jacobson Naik, Umesha C. Effect of organic manures and bio-fertilizers on growth and yield of Groundnut (*Arachis hypogaea* L.) The Pharma Innovation Journal. 2022;11(5):1249-1251.