



Effect of Organic Manure on Yield of *Arachis hypogaea* L. Indapur Tahsil Maharashtra

Sagar Kale*, Shashikant Chavan and Kishor Bhosale

PG Research Centre, Department of Botany, Tuljaram Chaturchand College of Art, Commerce and Science, Baramati, Pune.

Abstract

In the present research were carried out to study the effect of different sources of organic manures on yield of groundnut at Palshdev Indapur Tahsil, Pune district, Maharashtra during Rabi 2021. The use of organic manures in agriculture improves the quality and fertility of the soil. The organic manure increased the plant productivity, morphological properties and yield of groundnut plants. Moss powder of *Bryum ramosum* and *Fissidens grandifolia* application significantly recorded higher number of groundnut productivity in the years. followed by the application of vermicompost, Composted poultry manure, Farm yard manure.

Keywords: Organic Manure, *Arachis hypogaea* L. and Indapur.

Introduction

India has remained in the second among the top *Arachis hypogaea* L. producing countries despite having the largest area under groundnut cultivation in the world. *Arachis hypogaea* L. is a unique and important oilseed crop in Maharashtra. In Maharashtra total area under kharif *Arachis hypogaea* L. crop during 2019 is 187500 ha and total production is 193827 tones along with productivity 1034 kg / ha. (2012-13). Nearly half of the essential vitamins and one-third of the essential minerals are found in the *Arachis hypogaea* L. kernel, which is primarily used to make edible oil. Hence, *Arachis hypogaea* L. played an important role in nutritional security to the resource poor farmers. In addition, *Arachis hypogaea* L. seeds have provide high nutritive value for human consumption and for cake production as well as the green leaf is used as hay for livestock and generally the crop acted as good source of biological nitrogen fixation (Nautiyal *et al.*, 2011). In recent years, chemical fertiliser has become necessary for crop cultivation, but it is costly for those without the economic capacity to buy fertilizer. Therefore, the current trend is to explore the possibilities of supplementing organic manures like farm yard manure, vermicompost, poultry manure and moss powder of *F. grandifolia* and *B. ramosum* etc. Indigenously available organic sources of nutrients have enhanced the efficiency and reduced the requirements of chemical fertilizers (Bhat *et al.*, 2007). Hence, it is necessary to integrate different sources of nutrients to meet the crop requirement. Such integrated approach with special emphasis on combined application of inorganic fertilizers

with organic manures would sound well in oilseed crops like groundnut grown under aberrated climatic conditions. Therefore, an experiment was conducted to study the effect of moss species and some organic manures sources of nutrients on yield of groundnut in Indapur Tashil Maharashtra.

Materials and Methods

Field experiments were carried out to study the effect of different sources of organic and inorganic nutrients on yield attributed and yield of groundnut at Tanaji kale Farm Palshdev Indapur tashil Pune district, Maharashtra located at Latitude 17.6544373 and Longitude 74.3675376 during Rabi 2021. The soil at the experimental site used to have a sandy clay loam texture, was moderately well-drained, and, according to a chemical analysis, had high levels of potassium (499.00 kg ha⁻¹), low levels of nitrogen (130.00 kg ha⁻¹), and medium levels of phosphorus (9.80 kg ha⁻¹). It also contained 0.54 percent organic carbon and had a pH of 8.36. The experiments were laid out in split-plot design consisting of twelve treatments (four main and three sub plots) with 3 replications. The main plot consisted of Farm yard manure @ 11.00 t ha⁻¹(T₁), Composted poultry manure @ 4.0 t ha⁻¹ (T₂), Vermicompost @ 4.0 t ha⁻¹ (T₃) and *Bryum ramosum* (Hook) Mitt. powder (T₄), *Fissidens grandifolia* sp. Nov. powder (T₅). The groundnut variety *TMV-13* was used for treatment. Beds and channel were formed, layout was taken and organic manures were applied to each plot in accordance with the treatments assigned, incorporated manually and levelled. The seeds were sown in a plot size of 6.0 m x 5.0 m spaced with 30 x 10 cm for each treatment during *Rabi* 202.

Observations were recorded in 10 randomly taken and tagged plants from each replication on Number of pods plant⁻¹, Number of kernels pod⁻¹, 100 kernel weight (g), pod yield and haulm yield of groundnut (kg ha⁻¹) of different treatments. The harvested pods yield from each net plot cleaned separately as per the moisture content and expressed in kg ha⁻¹. The haulm yield of groundnut was recorded from the net plot area after enough sun drying and expressed in kg ha⁻¹. The data on various parameters were statistically analysed in split plot design as suggested by Gomez and Gomez (2010). Wherever the treatment difference was significant, critical differences were worked out at five per cent probability level.

Results and Discussion

Table 1: Effect of different organic and inorganic treatments on yield of groundnut.

| Treatments | Plant height | No. of branches | No of pods | Pod yield | Haulm yield | Shelling |
|----------------------|--------------|----------------------|----------------------|------------------------|------------------------|----------|
| | (cm) | Plants ⁻¹ | Plants ⁻¹ | (Kg ha ⁻¹) | (Kg ha ⁻¹) | % |
| Control | 18.50 | 5.60 | 13.17 | 2101 | 4819 | 31.44 |
| T₁ | 25.95 | 8.89 | 17.18 | 2960 | 5753 | 50.95 |
| T₂ | 26.14 | 8.90 | 17.11 | 2795 | 5838 | 60.95 |
| T₃ | 26.70 | 8.93 | 17.14 | 2045 | 5877 | 62.34 |
| T₄ | 27.18 | 9.46 | 18.00 | 3393 | 6300 | 65.39 |
| T₅ | 27.00 | 9.43 | 18.19 | 3209 | 6175 | 64.00 |

T₁ -Farm yard manure – FYM

T₂ - Composted poultry manure

T₃ - Vermicompost

T₄ - *Fissidens grandifolia* sp. Nov. powder

T₅ - *Bryum ramosum* powder

Organic manure are the preparations of living organisms waste materials and this use in groundnut crop for investigation of their effect on morphological properties and yield of groundnut plants (Table 1). Application of organic manure increased the plant productivity. *F. grandifolia* and *B. ramosum* powder application significantly recorded higher number of groundnut productivity in the years. followed by the application of vermicompost, Composted poultry manure, Farm yard manure – FYM. These results were corroborated with the findings of Ramasamy and Umapathi, (2010). The beneficial effect of vermicompost on yield and yield attributes might be attributed to its ability of sustain availability of nutrients throughout the growing season. The increased balanced C:N ratio might have increased the synthesis of carbohydrates with ultimate improvement in yield and yield attributes. These findings corroborate with those of Mathivanan *et al.*, (2012), Kondappa *et al.*, (2009) and Yadav and Yadav (2010). Poultry manure is excellent organic manure, since it contains high amount of nitrogen, phosphorus, potassium and other essential nutrients. Poultry manure improves the number of pods per plant, pod yield and haulm yield in groundnut as reported by Subrahmaniyan *et al.*, (1999). Groundnut being a leguminous crop, capable of fixing atmospheric nitrogen and application of fertilizers including gypsum with organic manures enhanced the productivity of groundnut. Veeramani *et al.*, (2012) observed similar findings. *F. grandifolia* and *B. ramosum* Mosses can improve soil structure, increase soil water holding capacity, and provide essential nutrients such as nitrogen, phosphorus, and potassium. They can also enhance microbial activity in the soil, which can lead to improved plant growth and yield.

Conclusion

Organic manure management is an important aspect of sustainable agriculture, and it can play a vital role in improving the yield and quality of groundnut crops. The use of organic manure helps to improve soil fertility, enhance crop growth and yield, reduce soil erosion, and reduce the incidence of pests and diseases. Different types of organic manure can be used, including farmyard manure, compost, green manure, and vermicompost. Farmers should choose the appropriate type of organic manure based on their soil type, crop requirements, and availability of resources.

References

- Bhat, M.A., Singh, R and Kohli, A. 2007. Effect of integrated use of farm yard manure and fertilizer nitrogen with and without sulphur on yield and quality of Indian mustard. *Journal of the Indian Society of Soil Science*. 55 (2): 224-226
- Gomez, K.A. and A.A. Gomez. 2010. *Statistical procedures for Agricultural Research* (4th ed). Wiley India Pvt. Ltd., New Delhi, India.
- Kondappa, D., B.M. Radder, P.L. Patil, N.S. Hebsur and S.C. Alagundagi. 2009. Effect of integrated nutrient management on growth, yield and economics of chilli in a vertisol. *Karnataka Journal of Agricultural Sciences*. 22: 438-440.
- Mathivanan, S., A. Chidambaram, P. Sundaramoorthy and R. Bakiyaraj. 2012. Effect of vermicompost on growth and yield of groundnut. *International Journal of Environmental Biology*. 2 (1): 7 -11.
- Nautiyal, P.C., Ravindra, V., Rathnakumar, A.L., Ajay, B.C., and Zala, P.V. 2011. Genetic variations in photosynthetic rate, pod yield and yield components in Spanish groundnut cultivars during three cropping seasons. *Field Crops Research*. 125: 83–91.
- Ramasamy, P.K. and S. Umapathi. 2010. Efficacy of vermicompost on the head yield status of the sunflower plant (*Helianthus annuus* L.). *Pollution Research*. 29 (3):417-420.
- Subrahmaniyan K. N., P. Arulmozhi and Kalaiselvan. 1999. Effect of irrigation layout, irrigation and fertilizer levels on the yield of rainfed groundnut. *Crop Research*. 18: 19-21.
- Veeramani, P., K. Subrahmaniyan and V. Ganesaraja. 2012. Organic manure management on groundnut. *Wudpecker Journal of Agricultural Research*. 1(7): 238 – 243.
- Yadav, S.S. and N. Yadav. 2010. Effect of integrated nutrient management on yield of okra in zaid crop. *Bhartiya Krishi Anusandhan Patrika*, 25: 2-4.