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INFLUENCE OF ORGANIC AMENDMENTS ON YIELD AND ECONOMICS OF DOLICHOS BEAN CV KONKANBUSAN

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ABSTRACT

The experiment was conducted to Sustainable Water Management for Dolichos bean Production in organic systems by organic amendments in the drought-prone area in Salem district (Tamilnadu). The experiment was laid out in a randomized block design with 14 treatments in 3 replications. The treatment schedule included various levels of bulky (25 and 75 % N) and Zconcentrated organic manures (25 and 75 % N), inorganic fertilizers along with absolute control. The bulky organic manures used were FYM and vermicompost and the concentrated manures used were neem cake and groundnut cake. The nutrient content of bulky and concentrated organic manures used in the study were FYM (0.80, 0.41 and 0.74 % NPK), vermicompost (1.60, 2.20 and 0.67 % NPK), poultry manure (3.47, 1.33 and 3.1 NPK), neem cake (5.2, 1.0 and 1.4 % NPK) and castor cake (4.1, 1.9 and 1.4 % NPK). The quantity of organic manures required was computed on the basis of nitrogen equivalent to substituting the recommended dose of chemical fertilizer (32:72 kg NP ha^{-1}) in the garden bean. Among the organic manures and concentrated oil cakes applied, 75 percent N supplied through vermicompost @ 2.41 t ha^{-1} along with 25 percent N supplied through neem cake @ 0.22 t ha^{-1} followed by 75 percent N supplied through poultry manure @ 0.61 t ha^{-1} along with neem cake @ 0.22 t ha^{-1} were identified. whichrecorded the maximum level of yield attributes and economics of Garden bean.

Key words: Dolichos Bean, organic manures, yield and economics

INTRODUCTION

For improving the Water holding capacityof soil, bulky organic manures should be necessarily applied. FYM, vermicompost, poultry manure andpressmud are some of the commonly available organic manures which are widely used by the farmers. Organic manures which are tried in the present investigation are FYM, poultry manure, oil cakesandvermicompost. Among the varied organic inputs, Farm yard manure is considered as a repository of plant nutrients.

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The role of FYM is multidimensional, varying from building up of organic matter, good soil aggregation, permeability of soil and related physical properties to long lasting supply of several macro and micronutrients, besides, improving water holding capacity of soil (Gupta *et al.*, 1983). Vermicompost produced using earthworm is another rich and recognized source of macro and micro-nutrients and contributes much towards improving the fertility of soil. Vermicompost contains major and minor nutrients in available form along with enzymes, antibiotics, vitamins, beneficial microorganisms and other plant hormones and havedefinite advantage over other organic manures in respect of quality and shelf life of produce (Meerabai and Raj, 2001). Kale *et al.*, (1992) found that the application of vermicompost to fields improved yield and benefits cost of vegetable crops.

MATERIAL AND METHODS

The seeds of Dolichos bean cv.KonkanBushan were dibbled singly at a spacing of 30 x 60 cm apart. The first irrigation was given immediately after sowing followed by life saving irrigation and subsequent irrigations were given once in a week. Incidence of sucking pests were managed by spraying with Neem seed kernal extract at 5%. Weeding was done where and when found necessary. Quantity of organic manures required was computed on the nitrogen equivalent basis. Recommended dose of N (36 kg ha^{-1}) was supplied in two different combinations like supply of 25% and 75% N through Bulky and 25% and 75%N through concentrated organic manures. The bulky organic manures used were FYM, Poultry Manure and vermicompost (VC) and the concentrated manures used were neem cake (NC) and castor cake (GC). 25 and 75 per cent N was calculated as 0.84 and 2.25 t ha^{-1} of FYM; 0.8 and 2.41 t ha^{-1} of VC; 0.25 and 0.61 t ha^{-1} of poultry manure; 0.22, and 0.78 t ha^{-1} of NC; 0.20 and 0.65 t ha^{-1} of CC to substitute the recommended dose of N (36 kg ha^{-1}). Bulky organic manures were applied as basal and concentrated cakes were top dressed in 2 split doses. First application was done at 20 days after sowing. The second was applied on 45^{th} day of sowing. Recommended dose of inorganic fertilizers were applied only in the conventional farming treatment.

Experimental design and treatment details

The experiment was laid out in a Randomized Block Design with three replication and fourteen treatments, viz.,

T_1 - Control

T_2 - Inorganic fertilizers (36:72 kg NP ha $^{-1}$)

T_3 - 25 % N as Farm Yard Manure (0.84 t ha $^{-1}$) +75 % N as Neem cake (0.78 t ha $^{-1}$)

T_4 - 75 % N as Farm Yard Manure FYM (2.52 t ha $^{-1}$)+ 25 % N as Neem cake(0.22 t ha $^{-1}$)

T_5 - 25 % N as Farm Yard Manure (0.84 t ha $^{-1}$) + 75 % N as Castor cake (0.65 t ha $^{-1}$)

T_6 - 75 % N as Farm Yard Manure (2.52 t ha $^{-1}$) +25 % N as Castor cake (0.20 t ha $^{-1}$)

T_7 - 25 % N as Vermicompost (0.80 t ha $^{-1}$)+75 %N as Neem cake (0.78 t ha $^{-1}$)

T_8 - 75 % N as Vermicompost (2.41 t ha $^{-1}$)+25 % N as Neem cake (0.22 t ha $^{-1}$)

T_9 - 25 % N as Vermicompost (0.80 t ha $^{-1}$) +75 % N as Castor cake (0.65 t ha $^{-1}$)

T_{10} - 75 % N as Vermicompost (2.41 t ha $^{-1}$)+25 % N as Castor cake (0.20 t ha $^{-1}$)

T_{11} - 25 % N as Poultry manure (0.25 t ha $^{-1}$) +75 % N as Neem cake(0.78 t ha $^{-1}$)

T_{12} - 75 % N as Poultry manure (0.61 t ha $^{-1}$) +25 % N as Neem cake (0.22 t ha $^{-1}$)

T_{13} - 25 % N as Poultry manure (0.25 t ha $^{-1}$) +75 % N as Castor cake (0.78 t ha $^{-1}$)

T_{14} - 75 % N as Poultry manure (0.61 t ha $^{-1}$) + 25 % N as Castor cake(0.22 t ha $^{-1}$)

RESULTS AND DISCUSSION

The pod yield per hectare has shown significant difference among all the treatment when compared with control (Table 1). The pod yield was highest (6.46 t ha^{-1}) in T_2 which was followed by T_8 (5.50 t ha^{-1}) and T_{12} (5.35 t ha^{-1}). The treatment T_3 and T_4 were however, on par with each other. The treatment, T_1 recorded the lowest pod yield of 2.72 tonnes per hectare.

In any management technology, the benefit cost analysis need to be focussed to assess its suitability for adoption. Considering the sale of tomato, garden bean and baby corn cultivated through inorganic manure at Rs.35 per kg and the organic tomato, garden bean and baby corn as Rs. 70 per kg (CIKS organic outlet, Salem), the highest return per rupee invested was obtained through application

of inorganic fertilizers due to higher yield statistics. Among the organic manure treatments, application of vermicompost @ 10.50 t ha^{-1} with neem cake @ 0.73 t ha^{-1} recorded the highest income and benefit cost ratio followed by poultry manure @ 2.16 t ha^{-1} with neem cake @ 0.73 t ha^{-1}. (Siddeswaran and Shanmugam. 2009) also have reported higher returns due to organically grown vegetables.

The soil physico-chemical properties yield quality and cost benefit analysis of garden bean under different treatments imposed with bulky and concentrated organic manures showed that the treatment combination of 75 per cent N supplied through vermicompost 10.73 t ha^{-1} along with 25 percent N supplied through 0.73 t ha^{-1} of neem cake followed by 75 per cent N supplied through poultry manure @ 2.16 t ha^{-1} along with 25 per cent N supplied through 0.73 t ha^{-1} of neem cake are recognized for valuable returns and were forwarded for further studies in garden bean.

CONCLUSION

Among the treatments comprising organic manures and concentrated oil cakes, 75 per cent N supplied through vermicompost2.41 t ha^{-1} along with 25 per cent N supplied through neem cake @ 0.22 t ha^{-1} followed by incorporation of poultry manure @ 0.61 t ha^{-1}25 per cent N supplied through neem cake @ 0.22 t ha^{-1} recorded the maximum values for growth, yield and yield attributes.Among the organic treatments, treatment supplied with vermicompost @ 2.41 t ha^{-1} + neem cake @ 0.22 t ha^{-1} recorded higher income and return per rupee invested. This was followed by treatment involving poultry manure @ 0.61 t ha^{-1}+ neemcake @ 0.22 t ha^{-1}.

REFERENCES

Gupta, U.S. and R.K.Gupta. 1983. Role of some agricultural and industrial by products in modifying soil physical properties. **Soils and Fertilizers,44**(2): Abstr. 1376.

Kale,R.D., B.C.Makesh, K.Bano and D.J.Bagyaraj.1992. Influence of vermicompost application on the availability of macro nutrients and selected microbial population in a paddy field. Soil Biol.Chem., 24(12): 1317-1320.

Mali, M.D., A.M. Musmade, S.S. Kulkarni, T. Prabu and R.M. Birade. 2004. Effect of organic manures on yield and nutrient uptake of cucumber (Cucumissativus cv. Himangi). **South Indian Hort., 53(1-6):** 110-115.

Meerabai ,M .and A.K.Raj.2001.Biofarming in vegetables. Kison World,28(4):15.

Shelke, S.R., R.N. Adule and V.M. Amrutsagr. 2001. Nitrogen management through organic and inorgancis in brinjal. **J. Indian Soc. Soil Sci., 49(3):**505-508

Siddeswaran, K and P.M.Shanmugam.2009.Organic Nutrient management in chillies-Bengal gram-Baby corn Sequence.Int.J.Agrl.Sc. Vol.1,pp 132-126.

Trehan,S.P. 1997. A rapid method for the estimation of potential immobilization of N after the addition of cattle slurry to soil. **J. Indian Soc. Soil Sci., 45:**14-19.

Umamaheswari, T. 2009. Impact of Organic practices for augmenting the productivity of hot pepper. **Ph.D. Thesis,** Annamalai University, Annamalainagar.

Yadav, R.L., B.S. Dwivedi, and P.S. Pandey. 2000. Rice wheat cropping system-Assessment of sustainability under green manuring and chemical fertilizer inputs. **Field crops Res., 65:**15-30.

Table.1.Effect of bulky and concentrated organic manures on yield per hectare in garden bean

Treatments	Pod yield (t / ha^{-1})
T_1 - Control	2.72
T_2 - Inorganic fertilizers (36:72 NP kg ha^{-1})	6.46
T_3 - FYM @ 10 t ha^{-1} + NC @ 2.25 t ha^{-1}	3.63
T_4 - FYM @ 15 t ha^{-1} + NC @ 1.50 t ha^{-1}	3.64
T_5 - FYM @ 10 t ha^{-1} + CC @ 2.0 t ha^{-1}	3.01
T_6 - FYM @ 15 t ha^{-1} + CC @ 1.50 t ha^{-1}	3.21
T_7 – VC @ 5 t ha^{-1} + NC @ 2.25 t ha^{-1}	5.26
T_8 - VC @ 7.5 t ha^{-1} + NC @ 1.50 t ha^{-1}	5.50
T_9 - VC @ 5 t ha^{-1} + NC @ 2.0 t ha^{-1}	4.43
T_{10} - VC @ 7.5 t ha^{-1} + NC @ 1.5 t ha^{-1}	5.08
T_{11} - PM @ 7.5 t ha^{-1} + NC @ 2.25 t ha^{-1}	5.10
T_{12} - PM @ 10 t ha^{-1} + NC @ 1.5 t ha^{-1}	5.35
T_{13} - PM @ 7.5 t ha^{-1} + NC @ 2.0 t ha^{-1}	4.32
T_{14} - PM @ 10 t ha^{-1} + NC @ 1.5 t ha^{-1}	4.13
S.ED	**0.02**
CD (P=0.05)	**0.05**

Table.2.Benefit cost ratio

Treatments	Cost of cultivation (Rs)	Gross Income (Rs)	Net Income (Rs)	BCR
T_1 - Control	14400	18720	4320	1.3
T_2 - Inorganic fertilizers (36:72 NP kg ha^{-1})	38745	108086	69741	2.8
T_3 - FYM @ 10 t ha^{-1} + NC @ 2.25 t ha^{-1}	38425	76850	38425	2.0
T_4 - FYM @ 15 t ha^{-1} + NC @ 1.50 t ha^{-1}	38425	76850	384252`0	2.0
T_5 - FYM @ 10 t ha^{-1} + CC @ 2.0 t ha^{-1}	38240	68832	30592	1`8
T_6 - FYM @ 15 t ha^{-1} + CC @ 1.50 t ha^{-1}	38240	72656	34416	1.9
T_7 – VC @ 5 t ha^{-1} + NC @ 2.25 t ha^{-1}	38745	92988	54243	2.4
T_8 - VC @ 7.5 t ha^{-1} + NC @ 1.50 t ha^{-1}	38745	100737	61992	2.6
T_9 - VC @ 5 t ha^{-1} + NC @ 2.0 t ha^{-1}	38425	84535	46110	2.2
T_{10} - VC @ 7.5 t ha^{-1} + NC @ 1.5 t ha^{-1}	38425	88377	49952	2.3
T_{11} - PM @ 7.5 t ha^{-1} + NC @ 2.25 t ha^{-1}	38993	89683	50690	2.3
T_{12} - PM @ 10 t ha^{-1} + NC @ 1.5 t ha^{-1}	38745	96862.5	58117.5	2.5
T_{13} - PM @ 7.5 t ha^{-1} + NC @ 2.0 t ha^{-1}	38425	80892.5	42467	2.1
T_{14} - PM @ 10 t ha^{-1} + NC @ 1.5 t ha^{-1}	38425	80692	42267	2.1