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Short Communication

Effect of different levels of zinc and farm yard manure (FYM) on the physico-chemical properties of soil and yield of green gram (*Vigna radiata* L). Var. laxmi-151

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Abstract
The field experiment was carried out at Department of Soil Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, India during *summer season* (March to May) of 2016. The experiment was laid out in 3×3 factorial randomized block design with 9 treatments in three replications. The cultivar this investigation was "LAXMI-151". There were 9 treatment combinations under the study namely, T_0 [$Zinc_0$+FYM_0] Control, T_1 [Zinc@0%+ FYM@50%], T_2 [Zinc@0%+ FYM@100%], T_3 [Zinc@50%+ FYM@0%], T_4 [Zinc@50%+ FYM@50%], T_5 [Zinc@50%+ FYM@100%], T_6 [Zinc@100%+ FYM@0%], T_7 [Zinc@100% + FYM@50%], T_8 [Zinc@100% + FYM@100%]. The recommended dose of fertilizer is i.e. 20:60:20 kg ha^{-1}. It is concluded that the best economy of different treatment concerned, the treatment T_6 (Z_2 + FYM_0) provides highest net profit of ₹16498.00 with cost benefit ratio is 1: 1.47 however, the minimum net profit of ₹3098.00 was recorded in the treatment T_2 (Z_0 + FYM_2) with cost benefit ratio is 1:1.07.

Keywords: green gram, economics, recommended dose of fertilizer, yield

Introduction
Green gram (*Vigna radiata* L.) commonly known as Mung bean, is an important conventional pulse crop of India. Its grain contains 24.20% protein, 1.3% fat, 60.4% carbohydrates; calcium and phosphorus are 118 and 340 mg per 100 g of seed. It is capable of fixing atmospheric nitrogen through *Rhizobium* species. It has a wide range of adaptability due to short growth period, high tonnage capacity and outstanding nutritional values of food, feed and forage. The yield level of *rabi* Mung is high as compared to *Kharif*. It can be grown during summer. It is one of the major protein rich pulse crop grown principally for both human and animal. Green gram can supplement the cereal-based diet to improve the nutritional value of food and has a special importance in intensive crop production system of the country for its short growing period. (Ahmed *et al*. 1978) [5].

India is a major pulse growing country of the world, sharing about 36 and 28% in the area and production of pulses, respectively. Green gram is one of the widely cultivated short duration grain legumes in India and occupies third place after Chickpea and Pigeon pea. In our country, green gram gives the highest yield under summer planting. (Satter *et al.* 1995) [5]. Food insecurity in the 21st century will even increase due to heat and drought stress induced by climate change, particularly in tropical and subtropical regions. Legumes are good and relatively cheaper source of proteins, carbohydrate, and minerals for developing countries including India. (Meiners *et al.* 1976) [3].

The basic concept of integrated nutrient management is the supply of the required plant nutrients for sustaining the desired crop productivity with minimum deleterious effect on soil health (Balasubramanian, 1999). Integrated use of organic and inorganic fertilizers guarantee improved soil health and fertility (Satyanarayana *et al*., 2002) [6].

FYM helps to improve and conserve the fertility of soil. FYM imparts dark color to the soil and thereby help to maintain the temperature of soil. The activity and population of beneficial soil organisms increased on application of FYM in soil. FYM is one of the oldest manure used by the farmer is growing crops because of its early availability and presence of almost all the nutrient required by plant (Nair 2000).

Zinc play important role in the correct functioning of many enzymatic systems, the synthesis of nucleic acids and auxins (plant hormones) metabolisms, protein analysis and normal crop development and growth **(**Mengel and Kirkby, 1982, Havlin *et al.*, 2006) [4]. This may be as a result of slower rate of translocation of Zn from roots to tops, i.e. zinc accumulation in the roots and lower Zn uptake (Stukenholtz *et al*., 1966) [7].

Materials and Methods

The field experiment was carried out at Department of Soil Science, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad, India during *summer season* (March to May) of 2016. The experiment was laid out in 3×3 factorial randomized block design with 9 treatments in three replications. The cultivar this investigation was "LAXMI-151". There were 9 treatment combinations under the study namely, T_0 [Z_0+FYM_0] Control, T_1 [Zinc@0%+ FYM@50%], T_2 [Zinc@0%+ FYM@100%], T_3 [Zinc@50%+ FYM@0%], T_4 [Zinc@50%+ FYM@50%], T_5 [Zinc@50%+ FYM@100%], T_6 [Zinc@100%+ FYM@0%], T_7 [Zinc@100% + FYM@50%], T_8 [Zinc@100% + FYM@100%]. The recommended dose of fertilizer is i.e. 20:60:20 kg ha^{-1}. Each treatment was assigned to a plot size of 2.0 m X 2.0 m.

- **Cost of cultivation:** For different treatments total cost was calculated on the basis of prevailing market rates of fertilizer, field preparation, sowing of seeds, labour charges, culture and intercultural operations etc.
- **Gross return:** For different treatments gross returns was calculated on the basis of prevailing market rate of produce.
- **Net profit:** It was calculated treatment wise. The cost of cultivation per hectare was subtracted from the gross income for computing net returns of each treatment. Net profit (Rs. ha^{-1}) = Gross return (Rs. ha^{-1}) - Cost of cultivation (Rs. ha^{-1})
- **Benefit Cost Ratio (BCR):** It was calculated treatment wise. The gross income per hectare of each treatment was divided by the cost of cultivation of respective treatments.

Table 1: Effect of different cost benefit ratio (C: B) of Different Treatment Combination with Green gram crop.

Treatment	Yield (q ha-1)	Straw yield (q ha-1)	Gross return (ha^{-1})	Total cost of cultivation (ha^{-1})	Net profit (ha^{-1})	Cost benefit ratio (C:B)
T_0	5.64	21.75	38190.00	32274.00	5916.00	1:1.18
T_1	6.10	20.12	40624.00	37274.00	3350.00	1:1.08
T_2	6.76	24.06	45372.00	42274.00	3098.00	1:1.07
T_3	6.69	23.86	44912.00	33524.00	11388.00	1:1.33
T_4	7.28	23.70	48720.00	38524.00	10196.00	1:1.26
T_5	7.62	22.75	50270.00	43524.00	6746.00	1:1.15
T_6	7.76	23.56	51272.00	34774.00	16498.00	1:1.47
T_7	7.86	23.95	51950.00	39774.00	12176.00	1:1.30
T_8	8.20	24.75	54150.00	44774.00	9376.00	1:1.20

$$\text{Benefit: Cost ratio} = \frac{\text{Gross return (q ha-1)}}{\text{Cost of cultivation (q ha-1)}}$$

Results and Discussion

Cost economic

The economics was calculated by total variable cost and depicted in the table 1. The maximum seed yield 8.20 q ha^{-1} was recorded T_8 [Zinc@100% + FYM@100%], and minimum seed yield 5.64 q ha^{-1} was recorded in T_0 (Control) and were found to be significant. The maximum straw yield 24.75 q ha^{-1} was recorded T_8 [Zinc@100% + FYM@100%], and minimum straw yield 21.75 q ha^{-1} was recorded in T_0 (Control). Among the different treatments studied with respect of maximum B:C ratio, The maximum B:C ratio was recorded in T_6 [Zinc@100%+ FYM@0%], provides highest net profit of ₹16498.00 with cost benefit ratio is 1: 1.47 however, the minimum net profit of ₹3098.00 was recorded in the treatment T_2 [Zinc@0%+ FYM@100%]. with cost benefit ratio is 1:1.07.

References

1. Ahamed KU, Nahar K, Rahmatullah MN, Faruq Gulam, Alamgir MD Ali. Yield components and different green gram varieties as affected by row spacing American-Eurasian Journal of Agronomy. 1978; 4(1):01-05.
2. Bhattacharya R, Vedprakash, Kundu S, Srivastava AK, Gupta HS. Effect of long term Manuring on soil organic Carbon, Bulk density and water retention characteristics under soyean-wheat cropping sequence in north-western Himalays. Journal of the Indian society of soil science. 2004; 52:238-242.
3. Meiners CR, Derise NL, Lau HC, Crews MG, Rirchey SJ, Murphy EW. Proximate composition and yield of raw and cooked mature dry legumes. J Agric. Food Chem. 1976; 24:1122-1126.
4. Mengal K, Kirkby EA. principle 3rd ed. International Potash Institute, 1982, 655.
5. Satter MA, Ahmed SU. Response of green gram (*Vigna radiata* L. Wilczek) to inoculation with *Bradyrhizobium* as affected by phosphorus levels. Proc. Int. Cong. Coom. 1995; 4:419-423.
6. Satyanarayana V, Prasad PVV, Murthy VRK, Boote KJ. Influence of integrated use of farmyard manure and inorganic fertilizers on yield and yield components of irrigated lowland rice. Indian J Plant Nutrition. 2002; 25(10):2081-2090.
7. Stulcenholtz DD, Olsen RJ, Gogan G, Olsen RA. On tlte mechanism of phosphorus-zinc interaction in com nutrition. Soil Science Society of America Proceedings. 1966; 30:759-763.