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Short Note

Effects of integrated nutrient management on maize (*Zea mays* L.): An economic analysis

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Abstract
The field experiment was carried out at Department of Soil Science, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, India during *kharif season* of 2015-16. The experiment was laid out in 3×3 factorial randomized block design with 9 treatments in three replications. It indicates that application of NPK, Zinc, FYM and Azotobacter increased the total cost of cultivation of yellow mustard markedly. The maximum total cost of cultivation (₹ 39290.92 ha^{-1}) and the maximum net return (₹ 56259.08 ha^{-1}) was computed in T_8 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 10 t ha^{-1}: Azotobacter 200 gm/10kg seed). while the maximum net return ₹$^{-1}$ invested (2.85) was recorded inT_6 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 0 t ha^{-1}: Azotobacter 0 gm/10kg seed).There should be a chance of better yield and net income, suggested all operations will be performing timely for this crop, because time is a very important factor and play great role for greater yield and its quality, before time or after time any operations in the field of agriculture production and quality will goes down.

Keywords: NPK, zinc, FYM and azotobacter, economic analysis

Introduction
Maize is globally a top-ranking cereal not only in productivity but also as human food, animal feed and as a source of large number of industrial products. The potential for enhanced use of maize for specially purposes based on existing uses and new products to meet the needs a future generation provides the researchers with unique challenges. Maize is also known as 'Queen of cereals' and kind of fodder maize has been usually considered as poor man's crops and occupying the place in the rich communities due to its multifarious uses as industrial food and feed crops.It is known as an indicator plant for evaluation of Zn deficiency of a soil. (Suke *et al.*, 2011) [8]. Maize is one of the important cereal crops in the world agricultural economy both as food grains for human and fodder and feed for cattle and poultry. Maize grain contains about 72% starch, 10% protein, 4.8% oil, 5.8% fibre, 3.0% sugar and 1.7% ash (Choudhary, 1993). Along with this, it is rich in vitamin A, vitamin E, nicotinic acid, riboflavin and contains fairly high phosphorus than rice and sorghum. Its fodder and hay contain 7-10% protein,15-36% fibre, 2.09 to 2.62% ether extract, 0.42-0.70% Calcium, 0.28-0.29% phosphorus, 0.45% Magnesium, 1.34% Potassium and 56% carbohydrate, therefore, it has very nutritive fodder and hay. Besides food grain, fodder and feed, it has prime importance in textile, starch and dye industries. (Rai 2006). In India 55 percent of the grain produce concurrently is used for food purposes, about 14 percent for livestock 310 Agricultural Situation in India feed. 18 percent for poultry feed, 12 percent for starch and 1 percent for seed. By the end of this century the expected demand will be around 46 percent for food, 14 percent for livestock feed, 19 percent for poultry feed, 19 percent for starch industry and 15 percent for seed.

Materials and Methods
The experiment was conducted during *kharif season* of 2015-16 at Crop research farm Department of Soil Science Allahabad School of Agriculture SHIATS-DU Allahabad. The experimental siteis located in the sub – tropical region with 25^0 27^1 N *latitude* 81^0 51^1 E longitudes and 98 meter the sea level *altitudes.* The experiment was laid out in a 3^2 RBD factorial design with three levels of NPK, Zinc and FYM, Azotobacter with nine treatments, each consisting of three replicates.

The total number of plots was 27. Maize (*Zea mays* L.) Var. Kirtiman Saurabh' were sown in kharif season plots of size 2 x 2 m with row spacing 50 cm and plant to plant distance 20 cm. The Soil of experimental area falls in order of Inceptisols and is alluvial in nature, both the mechanical and chemical analysis of soil was done before starting of the experiment to as certain the initial fertility status. The soil samples were randomly collected from 0-15cm depths prior to tillage operations. The treatment consisted of nine combination of T_0 (N:P:K:Zn 0:0:0:0 kg ha^{-1} + FYM 0 t ha^{-1}: Azotobacter 0 gm/10kg seed), T_1 (N:P:K:Zn 0:0:0:0 kg ha^{-1} + FYM 5 t ha^{-1}: Azotobacter 100 gm/10kg seed), T_2 (N:P:K:Zn 0:0:0:0 kg ha^{-1} + FYM 10 t ha^{-1}: Azotobacter 200 gm/10kg seed), T_3 (N:P:K:Zn 60:30:30:10 kg ha^{-1} + FYM 0 t ha^{-1}: Azotobacter 0 gm/10kg seed), T_4 (N:P:K:Zn 60:30:30:10 kg ha^{-1} + FYM 5 t ha^{-1}: Azotobacter 100gm/10kg seed), T_5 (N:P:K:Zn 60:30:30:10 kg ha^{-1} + FYM 10 t ha^{-1}: Azotobacter 200 gm/10kg seed), T_6 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 0 t ha^{-1}: Azotobacter 0 gm/10kg seed), T_7 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 5 t ha^{-1}: Azotobacter 100 gm/10kg seed), T_8 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 10 t ha^{-1}: Azotobacter 200 gm/10kg seed). The source of NPK, Zinc and FYM, Azotobacter as Urea, SSP, MOP, Zinc Sulphate respectively.

Treatment	Grain yield (q/ha)	Straw yield (q/ha)	Gross return ()	Cost of cultivation ()	Net return ()	C: B ratio
T_0	25.66	38.5	47474	25300.00	22174.00	1.87
T_1	28.43	40.7	52012	30337.50	21674.50	1.71
T_2	31.25	42.78	56584	35375.00	21209.00	1.59
T_3	35.22	45.7	63018	27257.96	35760.04	2.31
T_4	40.94	55.65	74011	32295.46	41715.54	2.29
T_5	43.36	58.69	78311	37332.96	40978.04	2.09
T_6	45.87	64.26	83496	29215.92	54280.08	2.85
T_7	49.00	70.25	89675	34253.42	55421.58	2.61
T_8	51.00	80.5	95550	39290.92	56259.08	2.43

Results and Discussion

Cost of cultivation was worked out on per hectare basis. Economics of different treatment combinations was worked out by taking into account the cost of cultivation and sale value of produce. The gross income and return ₹$^{-1}$ invested were worked out as follows for each treatment combination:

- Gross income (₹ ha^{-1}) = Cost of mustard seed (₹ ha^{-1}) + Cost of stover (₹ ha^{-1}).
- Net return (₹ ha^{-1}) = Gross income (₹ ha^{-1}) − Total cost of cultivation (₹ ha^{-1}).
- Net return ₹ ha^{-1}invested= Net return (₹ ha^{-1})/ Total cost of cultivation (₹ ha^{-1}).

Total cost of cultivation (₹ 39290.92 ha^{-1}) and the maximum net return (₹ 56259.08 ha^{-1}) was computed in T_8 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 10 t ha^{-1}: Azotobacter 200 gm/10kg seed). While the maximum net return ₹$^{-1}$ invested (2.85) was recorded inT_6 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 0 t ha^{-1}: Azotobacter 0 gm/10kg seed).

Conclusion

It is concluded that the total cost of cultivation (₹ 39290.92 ha^{-1}) and the maximum net return (₹ 56259.08 ha^{-1}) was computed in T_8 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 10 t ha^{-1}: Azotobacter 200 gm/10kg seed). While the maximum net return ₹$^{-1}$ invested (2.85) was recorded inT_6 (N:P:K:Zn 120:60:60:20 kg ha^{-1} + FYM 0 t ha^{-1}: Azotobacter 0 gm/10kg seed).

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References

1. Balyan JK, Singh P, Kumpawat BS, Jat ML. Effect of organic manure, fertilizer level and biofertilizers on soil nutrients balance in maize (*Zea mays* L.) Research on Crops. 2008; 9(2):308-310.
2. Kimdu S, Gajbhiye PN, Rao C, Bheemaiah G. Effect of integrated nutrient management on yield attributes, yield, nutrient uptake and economics of growing maize in tamarind-based cropping system. Indian Journal of Dryland Agricultural Research and Development. 2009; 24(1):81-86.
3. Kumar MAA, Gali SK, Hebsur NS. Effect of Different Levels of NPK on Growth and Yield Parameters of Sweet Corn Karnataka J Agric. Sci. 2007; 20(1):41-43.
4. Maurya KL, Sharma HP, Tripathi HP, Singh S. Effect of nitrogenand sulphur application on yield attributes, yield and net returns of winter maize (*Zea mays* L). Haryana J Agron. 2004; 21(2):115-116.
5. Nair AK. Effect of farmyard manure and fertilizer level on yield at maize (*Zea mays* L.) crop in Sikkim. Journal Agri. Sci. 2000; 70(4):229-240.
6. Singh MK, Singh RN, Singh SP, Yadav MK, Singh VK. Integrated nutrient management for higher yield, quality and profitability of baby corn (*Zea mays*). Indian Journal of Agronomy. 2010; 55(2):100-104.
7. Singh RN, Sulatiya R, Ghata KR. Effect of higher application of Nitrogen and potassium over recommended level on growth yield and yield attribute of late sown winter maize (*Zea mays* L.), crop research, Hissar. 2003; 26(1):71-74.
8. Suke SN, Deotale RD, Hiradeve P, Deogirker M, Sorte SN. Effect of nutrients and biofertilizer of chemical and biochemical parameter of Maize (*Zea mays* L.) J soil and crop. 2011; 21(1):107-112.