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An economic analysis of tomato (*Lycopersicon esculentum* L.) under jatropha based alley cropping system

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Abstract
The experiment was laid out in Randomized Block Design (Factorial) with three replication and 8 treatments under use differenent organic manures. The results revealed that maximum Gross returns (Rs. 70548.00) was observed with the Treatment [Fym+ Neem cake] and Maximum net returns (Rs. 32796.47) were also recorded with the same treatment. The highest benefit cost ratio was recorded as 1.87 with above said treatment.

Keywords: Tomato, jatropha, alley cropping

Introduction
Agroforestry is the intentional integration of trees and/or shrubs into crop and animal production. Agroforestry systems appeal to a triple bottom line value approach to provide ecological, social and economic benefits; they are designed to complement the characteristics and management objectives of a given site to provide multiple benefits. Objectives can include; revenue generation, conservation, ecosystem services, ecosystem restoration, increased efficiency, economic diversification and/or moderation of financial risk. Indicators of success are determined according to the management objectives of the site.

Jatropha is a bush that grows in regions around the equator. In equatorial regions where moisture is not a limiting factor, Jatropha can bloom and produce fruit throughout the year. It requires specialized nursery techniques to raise the saplings in the nursery. Jatropha starts yielding seeds from the end of first year and the economic yield stabilizes from the end of 5 year onwards. The plantation cost per hectare inclusive of site preparation, plant, material, maintenance for one year, overheads etc. shall be in the tune of Rs. 30,000 to Rs. 35,000 per hectare. It is a well known and very popular vegetable grown successfully throughout the Bangladesh. This fruit vegetable is popular for its nutritional value and diversified use like salad, juice, sauce etc. It contains 1.98g protein, 320 IU vitamin-A, 1.8 mg iron and 31 mg vitamin-C in 100 g edible tomato (Bose and Som, 1986).

Objectives
1. To calculate the economics of tomato Under Jatropha based Alley cropping system.

Materials and Methods
The present investigation entitled *"*An economic analysis of Tomato (*Lycopersicon esculentum* L.) Under Jatropha based Alley cropping system.*"* was conducted at the research and nursery area of a Department of Forestry, Sam Higginbottom Institute of Agricultural, Technology & sciences, (Deemed to be University), Allahabad (U.P) during the period October, 2015 to April, 2016.

Treatments Combination	
T0	Control
T1	Fym
T2	Neem cake
T3	Vermicompost
T4	Fym + Neem cake
T5	Fym + Vermicompost
T6	Neem + Vermicompost
T7	Fym + Neem cake + Vermicompost

Results and Discussion

The maximum Gross realization (Rs. 70548.00) was observed with the Treatment [Fym+ Neem cake] and Maximum net returns (Rs. 32796.47) were also recorded with the same treatment. The highest benefit cost ratio was recorded as 1.87 with above said treatment.

Tables 4.8: Estimation of cost of cultivation

S. No	Particulars	Unit	Qty.	Rupees (ha-1)	Cost (ha-1)
A	Land Preparation				
1	Plugging	Hours	4.00	500.00	2000.00
2	Plugging with (harrowing)	Hours	2.00	500.00	1000.00
3	Levelling of field (leveler)	Hours	2.00	300.00	600.00
4	Preparation of layout	Labour	10.00	160.00	1600.00
B	Fertilizer/manures application				
1	FYM transporting charge	Trolly	6.00	200.00	1200.00
2	FYM spreadig charge	Labour	3.00	160.00	480.00
3	Fertilizer application charge	Labour	3.00	160.00	480.00
4	Tomato seed	Gm	400-500	200.00	1000.00
5	Sowing charge				
6	Thinning & weeding	Laboures	10.00	160.00	1600.00
7	5 Irrigation total tuble	Hours	10.00	80.00	800.00
C.	Weed managements and earthing				
1	3 weeding was done by manually through 15 labour weeding	Laboures	15.00	160.00	2400.00
2	Harvesting	Laboures	8.00	160.00	1280.00
3	Rental value of land	Months	1.00	15000.00	15000.00
4	Supervision charges	Months	2.00	1200.00	2400.00
	Total cost of cultivation (ha^{-1})				31840.00

Table 4.9: Economics of different treatment combinations and benefit cost ratio for cultivation of tomato (*Lycopersicon esculentum* L.) under) Jatropha (*Jatropha integerrima*) based Alley cropping system

Treatment Organic Fertilizer		Cost of cultivation	fruit yield	Selling rate	Gross return	Net return	Benefit cost ratio
		Rs ha^{-1}	q ha^{-1}	Rs t^{-1}	Rs ha^{-1}	Rs ha^{-1}	
T_0	Control	31840.00	29.01	1200.00	34812.00	2972.00	1:09
T_1	FYM	45151.16	48.98	1200.00	58776.00	13624.84	1:30
T_2	Neem Cake	41663.06	53.80	1200.00	64560.00	22896.94	1:55
T_3	Vermicompost	34840.00	49.35	1200.00	59220.00	24380.00	1:70
T_4	FYM + Neem Cake	37751.53	58.79	1200.00	70548.00	32796.47	1:87
T_5	FYM+ Vermicompost	42663.06	47.31	1200.00	56772.00	14108.94	1:33
T_6	Neem + Vermicompost	35840.00	49.51	1200.00	59412.00	23572.00	1:66
T_7	FYM+ Neem Cake + Vermicompost	38749.49	49.12	1200.00	58993.12	20243.63	1:52

Conclusion

From the experimental findings it may be concluded that among 8 treatment combinations, [Fym + Neem cake] was found to be the most suitable in Allahabad agro-climatic condition with net return of Rs. 32796.47 and BCR of 1:87.

References

1. Arya PS, Vidyasagar, SR Singh. Effect of N, P and K on tomato seed production. Sci. Hort. 1999; 6:89-91.
2. Bagal SD, GA Sheikh, RN Adsule. Influence of different levels of N, P and K fertilizers on the yield and quality of tomato. J. Maharashtra Agric. Univ. 1989; 14:158-160.
3. Davies JN, GE Hobson. The constituents of tomato fruitthe influence of environment, nutrition and genotype. Crit. Rev. Fd. Sci. Nutr., 1981; 15:205-280.
4. Guichard S, N Bertin, C Leonardi, C Gary. Tomato fruitm quality in relation to water and carbon fluxes. Agronomie. 2001; 21:385-392.
5. Hochmuth GJ, KD Shuler, RL Mitchell, PR Gilreath. Nitrogen crop nutrient requirement demonstrations for mulched pepper in Florida. Proceedings of the Florida State. Hort. Soc. 1987; 100:205-209.
6. Igbinosa, Colleagues. Performance of tomato as influenced by organic manure and sowing date in Samaru, Zaria. International Journal of Agronomy and Agricultural Research (IJAAR), 2009. ISSN: 2351-3033.
7. Kuo CG. (ed). Adaptation of food crops to temperature and water stress: proceedings of an international symposium, Taiwan, 13-18 August 1992. Asian Vegetable Research and Development Centre, Publication No. 1993; 93-410:531.
8. Lee JM. Cultivation of grafted vegetables I, current status, grafting methods and benefits. Hort Science. 1994; 29:235-239.
9. Lincoln T, Z Edvardo. Assimilation of mineral nutrition. In: Plant physiology (4th ed.), Sinaur Associates, Inc. Pub. P. O. Box. 407. Sunderland, 2006, 705.
10. Marchner H. Mineral nutrition in higher plants. Acad. Inc. London. UK. 1995, 887.
11. Nair PKR. An Introduction to Agroforestry. Kluwer Academic Publishers, ICRAF, 1990.
12. Picken AJF. A review of pollination and fruit-set in the tomato *(Lycopersicon esculentum* Mill.). J Hort Sci. 1984; 59:1-13.
13. Rashid M. Sabji Biggan (in Bengali), Rashid Publishing House, 94, Old DOHS. Dhaka, 1999, 526.
14. Silva J, Muller J, Pyando H. Pruning and height density planting in tomatoes. Agropecuaria-Catarinense 5:57-61.Spp.) as rootstock for melon (*Cucumis melo* L.). Scientia Horticulturae. 1992; 83:353-362.
15. Traka-Mavrona E, M Koutsika-Sotiriou, T Pritsa. Response of squash (*Cucurbita*, 2000.

16. Wilcox J, G Catignani, C Lazarus. Tomatoes and cardiovascular health. Crit. Rev. Food Sci. Nutr., 2003; 43(1):1-18.