Comparative economics of different integrated nutrient management treatments on acidlime production

U.B. Deshmukh, S.G. Bharad, M.M. Kadam and N.S. Wagh

Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola 444 104, India

ABSTRACT

Nutrition management is one of the important aspects in acidlime for improving the productivity and quality of fruit crops. Integrated nutrient management improve crop growth and quality of products, help in sustainable crop production through maintenance of soil productivity. Therefore keeping this fact in view an experiment was undertaken to calculate comparative economics of different integrated nutrient management treatments on acidlime production during 2010-11 and 2011-12 at Central Research Station, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The objective of the study was to analyse the comparative economics of different nutrient management treatments in acid lime. Further the study concluded that, the highest net monetary returns i.e., (Rs.304257) was obtained from the treatment T_{10} (75% RDF (450:225:225g NPK) + 50 kg FYM+100g *Azospirillum* + 100g PSB /Plant+200g $ZnSO_4$/plant) with highest benefit cost ratio 3.33.

Key words : FYM, Acidlime, Azospirillum,PSB, Yield, B:C Ratio,Profitability

Introduction

India contributes more than 11 percent of world fruit production and ranks second in world with annual production of 63.83 million tons from an area of 8.46 million ha (Anon., 2011) but this is not sufficient. A wide gap exists between domestic demand and supply for fruits and this gap can be bridged by increasing productivity at least equal to the extent possible through area expansion. India's fruit requirement for 2025 is estimated to 120 MT (Tiwari, 2005). These production and productivity targets can be achieved only if modern intensive horticulture is practiced using most recent technologies, including nutrient management. Ecophysiological conditions of Maharashtra are quite favorable for the production of various tropical and subtropical fruit crops. The mild tropical and semi arid climate of Western Vidarbha region is congenial for growing major tropical and sub-tropical fruit crops including citrus and especially acid lime. Among various citrus species acid lime grows well on wide range of soil from heavy to light with good drainage gives a better yield and quality. Vidarbha region is ideal for acid lime production. Hence there is great scope to increase the area, production and productivity of acid lime in the region through unique integrated nutrient management techniques.

Material and Methods

The experiment entitled "Comparative Economics of Different Integrated Nutrient Management Treatments on Acidlime Production" was conducted at Central Research Station, Dr. PDKV, Akola during the year 2010-11 and 2011-12. Experiments consisted

of eleven treatments *viz.*, T_1 - RDF (600 g N + 300 g P_2O_5 + 300 g K_2O)+ 50 kg FYM/plant, T_2 -T_1 + 200 g $ZnSO_4$/plant, T_3 - 75% RDF (450 : 225 : 225 g NPK) + 50 kg FYM + 500 g AM/plant,T_4 - T_3+ 200g $ZnSO_4$/plant, T_5. 75% RDF (450 : 225 : 225g NPK) + 50 kg FYM + 100g *Azospirillum*, T_6 - T_5 + 200g $ZnSO_4$/ plant, T_7 - 75% RDF (450 : 225 : 225g NPK) + 50 kg FYM + 500 g AM/Plant + 100g PSB /plant, T_8 - T_7 + 200gm $ZnSO_4$/plant, T_9-75% RDF (450 : 225 : 225g NPK) + 50 kg FYM + 100g *Azospirillum* + 100 g PSB /plant, T_{10} - T_9 + 200 g $ZnSO_4$/plant and T_{11} – Control.

Cost of cultivation of production of acidlime

Based on the prevailing prices of inputs at the time of their usage and market price of the produce at the time of their sale, the B: C ratio and net profit was worked out using the following formula.
Net return was calculated by deducting cost of cultivation from gross return.

Net profit per hectare (Rs/ha) = Gross monetary returns (Rs/ha) - Cost of cultivation (Rs/ha)

$$\text{Benefit: Cost ratio} = \frac{\text{Gross monetary returns (Rs /ha)}}{\text{Total cost of cultivation (Rs /ha)}}$$

Results and Discussion

Economics

In economicc of acidlime treatment the benefit cost ratio showed that, treatment T_{10} (75% RDF (450:225:225g NPK) + 50kg FYM+100g *Azospirillum* + 100g PSB /plant +200g $ZnSO_4$/plant/year) most remunerative for cultivation of acid lime with maximum B:C ratio with net benefit followed by treatment T_9 (75% RDF (450:225:225g NPK) + 50kg FYM+100g *Azospirillum* + 100g PSB /plant/year) and treatment T_8 (75% RDF (450:225:225g NPK) + 50kg FYM+ 500 g AM/plant + 100g PSB /plant+ 200g $ZnSO_4$/plant/year). It was clearly indicated that,highest net monetary return obtained from treatment T_{10} (Rs 3,04,257 /ha) with high benefit cost ratio (3.33) followed by T_9(Rs 2,94,616/ha) with benefit cost ratio 3.31 and T_8 (Rs 2,60,994 /ha) with benefit cost ratio 3.15.While, minimum net monitory return (Rs 83918 /ha) with less benefit cost ratio (1.93) was recorded in T_{11} (control).

Conclusions

The highest net monetary returns i.e. (Rs.304257)was

Table 1. Economics of acidlime under different nutrient management treatments.

Particulars	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}
Establishment cost	383	383	383	383	383	383	383	383	383	383	383
Harrowing (Tractor)	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
N	831	831	623	623	623	623	623	623	623	623	—
P	300	300	224	224	224	224	224	224	224	224	—
K	382	382	287	287	287	287	287	287	287	287	—
FYM	13850	13850	13850	13850	13850	13850	13850	13850	13850	13850	—
ZnSO4	—	554	—	554	—	554	-	554	-	554	—
VAM	—	—	1523	1523	—	—	1523	1523	-	—	—
Azospirillum	—	—	—	—	1385	1385	—	1385	1385	1385	—
PSB	—	—	—	-	-	—	970	—	970	970	—
Weeding	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800	2800
Harvesting	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900	4900
Cost A	26446	27000	27590	28144	27452	28006	28560	28144	28442	28976	11083
Cost B	60362	58808	61823	61602	64518	70714	81768	93262	98742	101417	32299
Cost C (Total cost)	86808	85808	89413	89746	91970	98720	110328	121406	127184	130393	43382
Yield QTL/ha	40.70	38.17	41.08	40.15	44.48	51.25	63.85	76.48	84.36	86.93	25.46
Gross return Rs/ha @50 Rs/kg	203500	190850	205400	200750	222400	256250	319250	382400	421800	434650	127300
Net monetary returns Rs/ha	116692	105042	115987	111004	130430	157530	208922	260994	294616	304257	83918
B: C ratio	2.34	2.22	2.29	2.23	2.41	2.59	2.89	3.15	3.31	3.33	1.93

Note : **Market price of fertilizers** : N 5 Rs/ kg, P 3.60 Rs/ kg, K 4.60 Rs/ kg, $ZnSO_4$ 20/kg FYM 1 Rs/ kg, PSB 35 Rs/ kg, VAM *105*Rs/ kg, *Azospirillum* 50 Rs/ kg
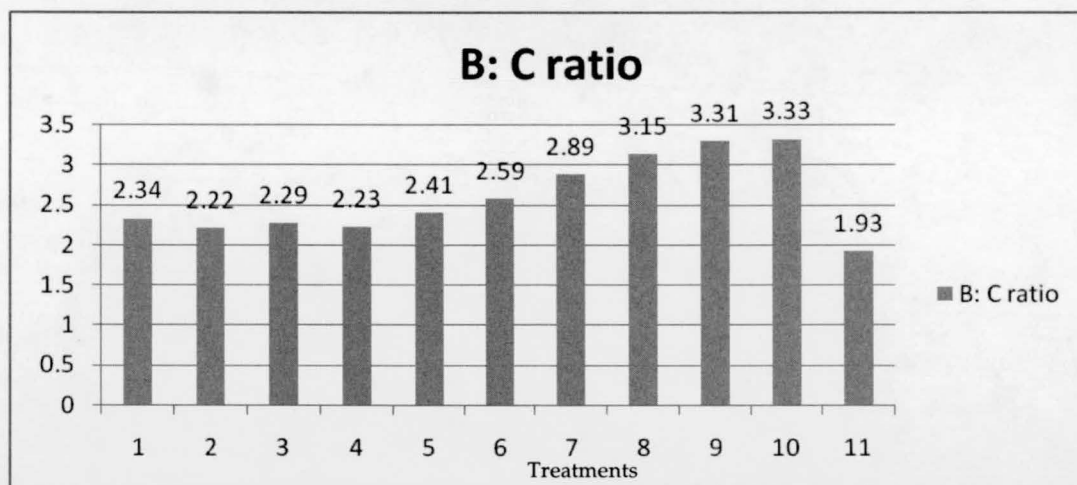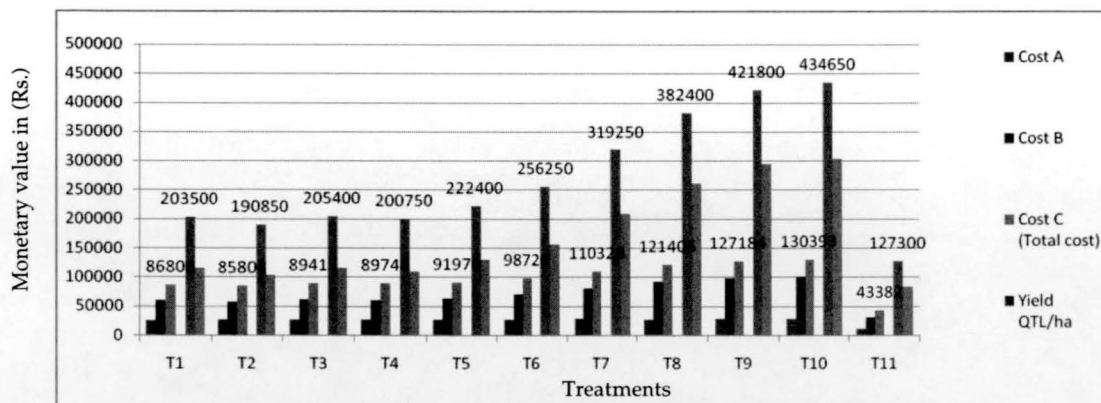
Comparative Cost Concepts of Acidlime Production.
(Monetary value in Rupees - Y axis and Treatments - X axis)

obtained from the treatment T_{10}(75% RDF (450:225:225g NPK) + 50 kg FYM + 100g *Azospirillum* + 100g PSB /Plant + 200g $ZnSO_4$/plant) with high benefit cost ratio 3.33.

References

Musmade, A. M., Jagtap, D.D. Pujari, C.V. and S.A. Hiray, 2009. Integrated nutrient management in acid lime.*The Asian J. Hort.* 4(2): 305-308.

Pawar, N.S. 2011. *Integrated nutrient management in acid lime.* M.Sc. Dr.P.D.K.V,Akola. Thesis (Unpub). Pp. 22-48.

Ram, R.A., Bhriguvanshi, S.R. and Pathak, R.K. 2007. Integrated plant nutrient management in guava cv. Sardar. *Acta Hort.* 735: 345-350.

Yadav, I.S. 1999. An overview nutrient management in horticultural crops. *Indian Hort.* 43(4): 4-5.