

Effect of Nutrient Management Throptugh Organic Sources on Productivity and Profitability of Guava (*Psidium guajava* L.) under Vindhyan Region

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Abstract The field experiment was undertaken during kharif of 2010 to study the effect of nutrient management through organic sources on guava trees. Results showed that application of various organic substances increased plant spread and number of branches/plant of guava, fruit yield and fruit acidity as compared to control. The highest values of these parameters were recorded for trees applied with poultry manure at 20 kg/tree, followed by the trees applied with FYM. The maximum net returns and B:C ratio was also recorded highest with poultry manure. Significantly higher macro nutrient content was also recorded with applied poultry manure at 20 kg/tree.

Keywords Guava spread, Fruit acidity, Economics.

Introduction

Guava (*Psidium guajava* L.) is one of the important fruit crop of tropical and sub-tropical regions of India. It is a hardy crop and can be grown satisfactorily on marginal soil with minimum care. It is popularly

known as ‘Apple of Tropics’ and claims to be the fourth most important fruit in area and production after mango, banana and citrus, Chemical based farming is not sustainable because of many problems such as loss of soil fertility from excessive erosion and associated plant nutrients loss, surface and ground water pollution from fertilizers and sediments, impeding shortages of non-renewable resources and low farm income from high production costs. In view of this there is an increasing awareness worldwide about alternative agricultural systems known as integrated plant nutrient management, which implies the maintenance or adjustment of soil fertility and plant nutrients supply for sustaining desired crop integrated manner (1). Use of organic manures along with bio-fertilizers and crop residues as a cheap source of available nutrients to plants has resulted in beneficial effects on growth, yield, quality and nutrient concentration in plant of various fruit crops. However, information are lacking on this aspect under semi arid climatic conditions of Vindhayan region we choose present investigation on effect of nutrient management through organic sources on productivity and profitability of Guava (*Psidium guajava* L.) under Vindhyan region.

Materials and Methods

A field experiment was carried out during *kharif* of 2010 at the Agricultural Research farm Rajiv Gandhi Campus, (BHU) Barachha, Mirzapur which is situated in Vindhyan region under agro-climatic zone III A (semi-arid eastern plain zone). The soil of the experimental field was sandy clay loam and having rich in

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Table 1. Effect of nutrient management through organic sources on growth parameter of guava. NS = Non-significant.

Treatments	Growth parameters						Economics	
	Plant spread (m)		No. of Branches plant		Fruit yield (kg/plant)	Acidity (%)	Net returns	B:C ratio
	150 Days	180 Days	150 Days	180 Days				
T ₁ : Poultry manure	3.87	4.08	25.00	26.00	35.12	0.386 (0.62)	53380	3.57
T ₂ : FYM	3.37	3.53	22.00	22.00	32.11	0.385 (0.62)	50878	3.56
T ₃ : Egg shell	3.13	3.28	21.00	21.33	29.25	0.365 (0.60)	53275	3.18
T ₄ : Paddy straw	3.02	3.17	19.67	20.00	26.45	0.353 (0.59)	36438	2.62
T ₅ : Green manure	2.90	3.05	18.33	19.00	23.63	0.335 (0.57)	36479	2.82
T ₆ : Wheat straw	2.73	2.88	17.67	18.00	24.12	0.316 (0.56)	25408	2.01
T ₇ : Mung straw	2.77	2.92	17.00	17.33	21.75	0.308 (0.55)	27272	2.14
T ₈ : Til straw	2.60	2.75	16.33	16.67	20.19	0.254 (0.50)	20108	1.56
T ₉ : Maize straw	2.45	2.60	16.00	16.33	18.47	0.254 (0.43)	19108	1.48
T ₁₀ : Removal of weed and spreading	2.22	2.37	15.33	16.00	15.10	0.230 (0.41)	16272	1.27
T ₁₁ : Interculture	2.12	2.27	14.33	14.67	12.10	0.245 (0.43)	18786	1.36
T ₁₂ : Control	1.52	1.62	13.00	13.33	11.68	0.225 (0.32)	15390	1.17
CD (P = 0.05)	0.29	0.29	3.15	2.76	4.17	NS	-	-

available nitrogen (177.72 kg/ha) and potassium (113.31 kg/ha) but poor in available phosphorus (9.01 kg/ha) and slightly acidic in reaction (pH 6.5). The experiment consist of 12 nutrient management through organic sources based treatments [T₁ : Poultry manure at 20 kg/tree, T₂ : FYM at 25 kg/tree, T₃ : Egg shell, T₄ : Paddy straw, T₅ : Green manure at 100 g/tree, T₆ : Wheat straw, T₇ : Mung straw, T₈ : Til straw, T₉ : Maize straw, T₁₀ : Removal of weed and spreading, T₁₁ : Interculture and T₁₂ : Control] were replicated thrice in randomized block design. The research was done on Guava variety L-49 on 6 year old plant with spacing 7×7 m. All the parameters of guava has been recorded from June onward. Plant spread of selected plants measured with the help of meter tape along with East-West and North-South direction then calculated mean plant spread. Acidity of fruit was determined by titrating a known quantity of fruit pulp diluted with water against standard NaOH solution, using phenolphthalein as an indicator and after computing the mean it was recorded as acidity percentage as citric acid (2). The nutrient content in leaf was measured by using standard methods.

Results and Discussion

Effect on growth, fruit yield, fruit acidity and economics

Plant spread and number of branches plant of guava

(N-S and E-W) was recorded at 150 and 180 days was significantly influenced by different organic sources of nutrient management (Table 1). The significantly higher plant spread and number of branches/plant was noted under treatment T₁ (poultry manure 20 kg/tree) which was significantly superior over all other treatments at both the stages but in respect of number of branches/plant it was found at par with T₂ (FYM at 25 kg/tree), the application of poultry manure it was at par with FYM (32.11 kg/plant) but significantly superior over rest of the treatments. It might be due to high nutrient and mineral content present in poultry manure in comparison to other organic sources. This similar result was also observed earlier (4). The effect of organic resources on fruit acidity was showed non-significant influences. The highest net returns obtained from treatments T₁ (Rs 53,380/ha) with high benefit: cost ratio (3.57) followed by T₃ (Rs 53,275/ha) and T₂ (Rs 50,878/ha).

Effect on leaf nutrient content

The effect of different organic resources on leaf macro and micro nutrient composition was found to be significant influenced (Table 2). The maximum leaf macro nutrient N (1.92%), P (0.24%) and K (1.71%) content was recorded in application of poultry manure 20 kg/plant followed by application of FYM AT 25 kg/tree. It might be due to high nutrient and mineral content in poultry manure in comparison to other organic

Table 2. Effect of nutrient management through organic sources on leaf nutrient content at 180 days of guava plant. NS = Non-significant.

Treatments	Macro nutrient (%)				Micro nutrient (ppm)		
	N	P	K	Fe	Mn	Zn	Cu
T ₁ : Poultry manure	1.92	0.24	1.71	148.50	37.13	22.57	17.61
T ₂ : FYM	1.85	0.23	1.70	146.10	36.53	18.72	17.90
T ₃ : Egg shell	1.80	0.22	1.61	145.75	36.44	18.47	14.32
T ₄ : Paddy straw	1.83	0.20	1.64	146.75	36.69	15.65	14.62
T ₅ : Green manure	1.74	0.22	1.31	140.75	36.79	16.05	15.87
T ₆ : Wheat straw	1.65	0.20	1.30	132.50	33.13	19.10	15.37
T ₇ : Mung straw	1.68	0.18	1.32	147.15	33.78	14.10	12.91
T ₈ : Til straw	1.52	0.21	1.30	132.50	35.19	15.10	12.25
T ₉ : Maize straw	1.46	0.19	1.30	135.10	32.18	16.13	13.01
T ₁₀ : Removal of weed and spreading	1.35	0.18	1.29	132.10	31.15	14.55	12.95
T ₁₁ : Interculture	1.20	0.18	1.28	130.50	31.10	13.30	11.25
T ₁₂ : Control	1.12	0.17	1.27	128.50	30.50	13.28	11.05
CD (<i>P</i> = 0.05)	0.037	0.005	0.017	NS	NS	NS	NS

sources. This observation was supported by earlier worker (4). The effect of organic sources of nutrients on leaf micro nutrient composition viz., iron, zinc, copper and manganese were found to be non-significant amongst the various treatments.

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