

## Effect of different sources of nutrients on yield and quality of guava cv. L-49

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### ABSTRACT

Different sources of nutrients (mahua cake @ 10.4 kg, mustard cake @ 5.1 kg, neem cake @ 5.0 kg, FYM @ 34.7 kg, recommended dose of fertilizer-RDF- 260:320:260g of N: P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O, 50% mahua cake + 50 % RDF, 50% mustard cake + 50 % RDF, 50% neem cake + 50 % RDF, 50% FYM + 50 % RDF ) were applied on guava cv.L-49 plant <sup>-1</sup>year <sup>-1</sup> to assess the yield and quality. Application of nutrients irrespective of their sources and doses, markedly enhanced yield and quality of guava fruits over untreated control. The number of fruits, yield and most of the physical and quality parameter like fruit weight, fruit size, pulp weight, total sugar and ascorbic acid content were significantly higher in 50% neem cake + 50% RDF treatment. The plant treated with 50% mahua cake + 50% RDF showed higher TSS (11.0 °Brix), reducing sugar (4.22%) and TSS/acid ratio (33.85). Among the organic sources, mahua cake @ 10.4 kg and neem cake @ 5.0 kg resulted better yield. Better quality fruits was however harvested from FYM treated plants.

**Key words:** Nutrients, Guava, Yield, Quality

Guava (*Psidium guajava* L), the apple of tropics is one of the most common fruit crop in India. The productivity of guava in West Bengal (9.1 tonnes/ha) is comparatively low which is believed to be due to improper fertilizer management. Since guava bears almost throughout the year, proper doses of nutrient application is considered essential for maintaining the productivity and good health of the tree. Emphasis should be as much on improving fertilizer use efficiency as also on its productivity, profitability, sustainability and eco-friendliness. Therefore, without regular application of organic manure and recycling of crop residues it is not possible to maintain and sustain productivity. So, nutrient management practices involving organic and inorganic sources could prove very effective for achieving a cost effective and eco-friendly programme.

### MATERIALS AND METHODS

The field experiment was conducted in the year of 2002 at Horticultural Research Farm, Mondouri, Bidhan Chandra Krishi Viswavidyalaya, West Bengal, in sandy loam soil with a pH of 6.9 and containing 0.065% organic carbon, total N of 0.06%, available phosphorus and potassium of 28.20 and 40.80 ppm, respectively. Treatments (mahua cake @ 10.4 kg, mustard cake @ 5.1 kg, neem cake @ 5.0 kg, FYM @ 34.7 kg, recommended dose of

fertilizer-RDF- 260:320:260g of N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O, 50% mahua cake + 50 %RDF, 50% mustard cake + 50 % RDF, 50% neem cake + 50 % RDF, 50% FYM + 50 % RDF and untreated control ) were allocated in a randomized block design, replicated thrice. Different sources of nutrients were applied on guava cv. L-49 plant <sup>-1</sup> year <sup>-1</sup>. The observations on number of fruits per plant, fruit weight, yield per plant, fruit length and diameter were recorded at harvest stage. Quality parameters like total soluble solid (TSS), total sugar, reducing sugar, titrable acidity and ascorbic acid content of ripen fruits were analyzed following the methods described by A.O.A.C. (1984).

### RESULT AND DISCUSSION

#### Yield

The results revealed that the number of fruits per plant and yield were increased significantly over untreated control (Table 1). The combination of organic and inorganic fertilizer resulted higher production of fruits than only organic or inorganic sources. However, among different combinations organic and inorganic, 50% neem cake (2.5 kg/plant) + 50% RDF (130:160:130 g of N: P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O/plant) produced maximum number of fruits (327 per plant) and fruit yield (45.89 kg /plant and 12.76 t/ha). Similar types of

**Table 1 Effect of different sources of nutrients on yield and physical parameters of guava fruits**

Treatments	Number of fruits /plant	Fruit wt.(g)	Yield/ plant (kg)	Yield (t/ ha)	Fruit length (cm)	Fruit diameter (cm)	Core wt.(g)	Pulp wt.(g)
Mahua cake @ 10.4 kg	279.0	128.96	35.98	10.00	6.25	5.46	34.36	94.60
Mustard cake @ 5.1 kg	255.7	125.16	32.04	8.91	6.22	5.71	33.30	91.86
Neem cake @ 5.0 kg	290.7	123.50	35.89	9.98	6.18	5.64	31.06	92.44
FYM @ 34.7 kg	248.7	118.73	29.51	8.20	6.00	5.30	32.00	86.73
Recommended dose of fertilizer (RDF)	275.6	120.90	33.34	9.27	6.07	5.61	31.86	89.03
50%Mahua cake + 50% RDF	307.3	135.50	41.66	11.57	6.41	5.67	35.63	99.70
50% Mustard cake + 50% RDF	285.0	130.00	37.07	10.31	6.33	5.75	34.40	96.00
50% Neem cake + 50% RDF	327.0	140.50	45.89	12.76	6.50	5.83	35.40	105.10
50% FYM + 50 % RDF	264.6	122.50	32.34	9.02	6.10	5.55	30.90	91.60
Untreated control	215.0	115.55	25.10	6.98	5.82	5.28	33.63	81.36
S.Em (±)	7.886	2.419	1.195	0.332	0.091	0.095	1.484	1.796
CD at 5%	23.373	7.189	3.552	0.986	0.272	0.284	NS	5.336

**Table 2 Effect of different sources of nutrients on yield and physical parameters of guava fruits**

Treatments	T.S.S. ( <sup>o</sup> Brix)	Total sugar (%fresh weight)	Reducing sugar (%fresh weight)	Non reducing sugar (%fresh weight)	Titration acidity (%)	Ascorbic acid (mg/100g of pulp)	TSS/ Acid
Mahua cake @ 10.4 kg	10.60	6.83	4.05	2.46	0.328	120.0	32.31
Mustard cake @ 5.1 kg	10.43	7.05	4.05	2.86	0.473	115.6	22.05
Neem cake @ 5.0 kg	10.50	6.95	4.01	2.79	0.335	117.7	31.34
FYM @ 34.7 kg	10.70	6.66	3.72	2.78	0.380	125.0	28.16
Recommended dose of fertilizer (RDF)	10.16	6.47	3.59	2.66	0.425	119.0	23.91
50% Mahua cake + 50% RDF	11.00	7.02	4.22	2.69	0.325	137.5	33.85
50% Mustard cake + 50% RDF	10.20	6.76	3.7	2.86	0.418	123.6	24.40
50% Neem cake + 50% RDF	10.46	7.16	4.18	2.83	0.315	130.0	33.20
50% FYM + 50 % RDF	10.83	6.70	3.91	2.65	0.377	145.0	28.73
Untreated control	9.53	5.95	3.47	2.36	0.424	110.5	22.48
S. Em(±)	0.063	0.071	0.055	0.032	0.006	3.170	--
CD at 5%	0.187	0.209	0.146	0.094	0.018	9.419	--

results were also obtained by Pereira and Mitra (1999). Higher fruit number was mainly due to better vegetative growth and improvement in the physiological condition which caused higher percentage of flowering, fruit set and retention. Among the organic manure, neem cake @ 5.0 kg/plant and mahua cake @ 10.4 kg/plant gave better results.

#### Physical parameter of fruits

The fruit physical parameters like fruit length, diameter, fruit weight and pulp weight varied significantly among different treatments whereas, no significant variation was noted with respect to core weight (Table 1). The treatment combination of 50% neem cake (2.5 kg/plant) + 50% RDF (130:160:130 g of N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O /plant) produced maximum fruit weight (140.5g), pulp weight (105.10g), fruit length (6.5 cm) and fruit breadth (5.83cm). However, the combined treatment of 50% mahua cake (5.2 kg/plant) + 50 % RDF (130:160:130 g of N:P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O /plant) also showed higher fruit and pulp weight as well as fruit size (Table1).

Application of nutrients irrespective of their sources and doses, markedly enhanced yield and quality of guava fruits over untreated control. In the present investigation similar types of results were also obtained by Prasad (1989), Vilasurda and Baluyat (1990) and Pereira and Mitra (1999). The effect of inorganic fertilizers was however, more pronounced when it was supplemented with organic manure (Table1).

#### Quality parameter of fruits

Plant treated with 50% mahua cake (5.2 kg/plant) + 50 % RDF (130:160:130 g of N: P<sub>2</sub>O<sub>5</sub>:K<sub>2</sub>O/plant) recorded maximum TSS (11.00<sup>0</sup> Brix), reducing sugar (4.22%) and TSS/acid ratio (44.85) (Table-2). It might be due to higher content of potassium in the

mahua cake (Bhattacharyya,1998).The effect of potassium on fruit quality may be explained from the fact that potassium improved photosynthetic activity and also help in better translocation of metabolites from leaves to fruits. However, total sugar content of fruits (7.16%) was maximum in 50% neem cake (2.5 kg/plant) + 50% RDF (130:160:130 g of N: P<sub>2</sub>O<sub>5</sub> :K<sub>2</sub>O /plant) treatment whereas, the treatment 50% FYM (17.35 kg/plant) + 50% RDF (130:160:130 g of N:P<sub>2</sub>O<sub>5</sub> :K<sub>2</sub>O/plant) showed maximum ascorbic acid content (145 mg/100g of pulp). Among the organic sources FYM @ 34.7 kg/ plant produced better quality fruits.

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