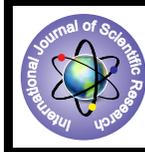


## Effect of micronutrient, growth regulators and bio-fertilizers on biochemical composition of mango (*Mangifera indica* L.) cv. Langra



### Horticulture

**KEYWORDS :** Micronutrients, growth regulators, bio-fertilizers, fruit quality traits.

**Akshata Tomar**

Corresponding author, PhD Scholar, Department of Horticulture, JNKVV, Jabalpur (MP)

**S. K. Pandey**

Professor, Department of Horticulture, JNKVV, Jabalpur (MP)

**P. K. Jain**

Professor and Head, Department of Horticulture, JNKVV, Jabalpur (MP)

### ABSTRACT

The present investigation entitled "Effect of micronutrient, growth regulators and bio-fertilizers on biochemical composition of mango (*Mangifera indica* L.) cv. Langra" was carried out at the Fruit Research Station, Imaliya, College of Agriculture, Jabalpur during 2012-13 on 40 years old orchard. Fruit quality parameters like TSS, total sugars, reducing sugar, non-reducing sugar, and acidity were observed. The results indicated, the different treatments did not showed any significant effect on fruit quality parameters except TSS. The treatment (T10) having combination of Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + Borax (0.5%) recorded significantly higher TSS (22.76 °Brix) along with maximum total sugars (19.97%), non-reducing sugar (14.53%) and minimum acidity (0.29%) as compared to control (T19) having values of TSS (18.07 °Brix), total sugars (15.62%), non-reducing sugar (9.36%) and minimum acidity (0.38%) respectively.

### Introduction

Mango (*Mangifera indica* L.) belongs to family Anacardiaceae and is characterized by the presence of resinous canal. It is one of the most important fruit crops of India and referred to as the "King of Fruits" because of its delicious taste and excellent flavor and attractive fragrance. Mango is delicious fruit and holds a great degree of nutritive value. There is need to study the effect of integrated nutrient management to enhance the nutritive value and quality of mango fruit. Integrated nutrient management refers to maintenance of soil fertility and plant nutrient supply to an optimum level for sustaining the desired crop productivity through optimization of the benefits from all possible sources of plant nutrient in an integrated manner.

### Materials and Method

The present investigation was conducted at the Fruit Research Station, Imalia, College of Agriculture, JNKVV, Jabalpur, during the year 2012-13 on 40-year-old trees of mango cv. Langra planted at 10x10m. The experiment was planned with 19 treatments combination with three replicated in randomized block design (one tree per treatment per replication). To evaluate the effect of treatment's the fresh ripen fruits were cleaned and washed. The fruits were cut longitudinal to collect fresh pulp in a glass container which was stored at 4°C till further use in analysis. The quality parameters viz., TSS, acidity, total sugars, non-reducing sugar and reducing sugar were determined according to the procedure as described by Rangana (1991).

### Result and Discussion

The result of this study revealed that all the fruit quality parameters were found non-significant except TSS due to integrated nutrient management treatment. The significantly higher TSS (22.76 °Brix) was recorded in the treatment T<sub>10</sub> having combination Vermicompost (30 kg) + PSB (250g) + Azotobacter (250g) + Borax (0.5%). Maximum total sugars, non-reducing sugar and minimum acidity were also found in T<sub>10</sub> 19.97%, 14.53%, 61.25 mg/100g and 0.29% respectively, but there were no significant difference found among the treatments. The minimum values for TSS (18.07 °Brix), total sugars (15.62%), non-reducing sugar (9.36%) and maximum acidity (0.38%) were recorded in control (T<sub>19</sub>). This may be because of contribution of boron along with soil application of RDF, bio-fertilizers and vermicompost for different quality traits like TSS and different fractions of sugars might be due to hydrolysis of complex polysaccharides into simple sugar, synthesis of metabolites and rapid translocation of photosynthetic products and minerals from other parts of developing fruits. It was observed that N<sub>2</sub> catalyze the functioning of enzymes in the physiological processes, which have improved the TSS content of the fruits. The highest total sugar attributed to the involvement of N<sub>2</sub> in various energy sources like amino acids and amino sugars. Similar results are in confirmatory with Banik et al (1997), Kavitha et al. (2000), Dutta (2004), Samant et al. (2008) and, Dutta et al. (2010).

**Table 1. Influence of growth regulators, micronutrients and bio-fertilizers on TSS, and acidity content**

Treatments	TSS (°Brix)	Acidity (%)
T1= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250)	20.87	0.37
T2= Vermicompost (15 kg) + PSB (125g) + Azotobacter (125)	19.33	0.38
T3= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + NAA (20 ppm)	21.27	0.33
T4= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + NAA (40 ppm)	20.93	0.37
T5= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + GA <sub>3</sub> (20 ppm)	21.23	0.35
T6= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + GA <sub>3</sub> (40 ppm)	20.63	0.37
T7= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + ZnSO <sub>4</sub> (0.5%)	21.53	0.31
T8= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + ZnSO <sub>4</sub> (1%)	22.10	0.32
T9= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + Borax (0.25%)	22.60	0.30
T10= Vermicompost (30 kg) + PSB (250g) + Azotobacter (250) + Borax (0.5%)	22.67	0.29
T11= Vermicompost (15 kg) + PSB (125g) + Azotobacter (125) + NAA (20 ppm)	21.07	0.35
T12= Vermicompost (15 kg) + PSB (125g) + Azotobacter (125) + NAA (40 ppm)	21.73	0.33
T13= Vermicompost (15 kg) + PSB (125g) + Azotobacter (125) + GA <sub>3</sub> (20 ppm)	20.87	0.37

T14= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + GA <sub>3</sub> (40 ppm)	21.07	0.36
T15= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + ZnSO <sub>4</sub> (0.5%)	21.50	0.32
T16= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + ZnSO <sub>4</sub> (1%)	20.87	0.33
T17=Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + Borax (0.25%)	22.40	0.32
T18= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + Borax (0.5%)	22.50	0.31
T19= Control	18.07	0.38
CD at 5%	2.21	NS

**Table 2. Influence of growth regulators, micronutrients and bio-fertilizers on total sugars, reducing sugar and non-reducing sugar**

Treatments	Total sugars	Non reducing sugar	Reducing sugar
T1= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250)	15.70	9.92	6.68
T2= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125)	15.67	9.67	5.99
T3=Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + NAA (20 ppm)	18.41	11.98	6.43
T4= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + NAA (40 ppm)	17.52	13.39	4.13
T5=Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + GA <sub>3</sub> (20 ppm)	18.24	11.74	6.50
T6= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + GA <sub>3</sub> (40 ppm)	18.16	11.82	6.34
T7= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + ZnSO <sub>4</sub> (0.5%)	18.87	12.19	6.68
T8= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + ZnSO <sub>4</sub> (1%)	19.18	12.68	6.50
T9= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + Borax (0.25%)	19.58	13.97	5.61
T10= Vermicompost (30 kg) + PSB (250g) + Azotobactor (250) + Borax (0.5%)	19.97	14.53	5.44
T11= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + NAA (20 ppm)	18.06	11.82	6.24
T12= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + NAA (40 ppm)	18.17	11.77	6.40
T13= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + GA <sub>3</sub> (20 ppm)	17.69	11.64	6.05
T14= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + GA <sub>3</sub> (40 ppm)	16.47	11.13	5.43
T15= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + ZnSO <sub>4</sub> (0.5%)	18.79	12.97	5.81
T16= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + ZnSO <sub>4</sub> (1%)	18.86	14.15	4.71
T17=Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + Borax (0.25%)	19.80	13.66	6.14
T18= Vermicompost (15 kg) + PSB (125g) + Azotobactor (125) + Borax (0.5%)	19.49	13.34	6.15
T19= Control	15.62	9.36	6.26
CD	NS	NS	NS

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