Plant Archives Vol. 25, No. 2, 2025 pp. 237-240 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org

DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2025.v25.no.2.034

EFFECT OF INTEGRATED NUTRIENT MANAGEMENT (INM) IN GUAVA *CV.* ALLAHABAD SAFEDA

Rajesh Singh* and Sunil Jat

Department of Horticulture, College of Agriculture (Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur) Rewa-486001, (M.P.) India

*Corresponding author E-mail:rajeshsinghjnkvv@yahoo.com

(Date of Receiving-25-05-2025; Date of Acceptance-03-08-2025)

ABSTRACT

The present investigation was conducted at Fruit Research Station Farm, Kuthuliya, Rewa (M.P). Guava (*Psidium guajava* L.) is one of the important fruit crops, Guava is a highly valuable tropical/subtropical fruit due to its nutritional content and ability to thrive in unfavourable conditions. The experiments were laid out in Randomized Block Design with three replications and Twelve treatments. Results revealed that application of different levels of fertilizer and biofertilizers application, organic manures and spray of micronutrient, either alone or in combination significantly increased the yield of guava. Application of T_9 50 percent dose of recommended fertilizers + 25 kg FYM + 5kg vermicompost was observed significantly value of higher length of the fruit (7.25cm), Width of the fruit (7.99 cm), the fewest seeds per fruit (205.22), average 100 Seed weight (1.37 gm), number of fruits (237.6), fruit weight (226.43g), yield per plant (48.26kg), yield per hectare (179.6q). The treatment T9 was found to be the most profitable treatment in guava exhibiting highest net return Rs. 479220. The treatment T_9 were the most beneficial treatment which may be followed for commercial guava cultivation on large scale.

***Key words*:** INM, NPK, Randomized Block Design

Introduction

Guava (*Psidium guajava* L.) is one of the important fruit crops originated in Tropical America extending from Mexico to Peru. Guava was introduced in India by Portuguese during 17th century (Menzel, 1986). Guava is a highly valuable tropical/subtropical fruit due to its nutritional content and ability to thrive in unfavourable conditions. In India, it ranks fifth in terms of area and production among major fruits, following mango, banana, and citrus. Although it is native to Tropical America, guava is cultivated worldwide in tropical and subtropical regions. Its popularity among fruit growers stems from its adaptability to various soils and climates, low cultivation costs, abundant fruit bearing, and high profitability due to its nutritional value.

Guava thrives well in humid and dry conditions. In India, guava is well adapted up to an altitude of 1000 m. The guava tree requires an annual rainfall of 1000-2000 mm. In deep tropic regions guava fetch more heavily with non-continuous winter season but at the time of flowering if temperature downs 23^{o}C and more than 27^{o}C reduces fruit set in guava. Mature guava trees moderately tolerate drought and cold conditions. It can survive only a few degrees of frost. According to these facts and its low cultivation costs, this crop is economically important in different tropical and subtropical countries.

The term “integrated nutrient management” refers to the optimization of the benefits from all potential sources of organic, inorganic, and biological components in an integrated manner for maintaining the fertility of the soil and the supply of nutrients to plants at an optimum level for maintaining the desired productivity. Bio-fertilizers formulations of microorganisms are beneficial to plants and, when applied to seed, root, or soil, make nutrients available to the plants through their biological activity in particular, as well as help to build up the micro flora and ultimately improve soil health in general. According to research, the integrated use of organic +

inorganic + bio fertilizers may improve soil productivity and crop yield with higher quality.

On average, the composition of FYM is usually (0.5%) N, (0.25%) P and (0.5%) K. Vermicompost is a natural fertilizer made from biodegradable organic waste that is free of chemicals. Vermicompost is rich in beneficial microorganisms such as nitrogen-fixing bacteria, phosphorus-solubilizing microbes, microflora that decompose cellulose, and other helpful microorganisms. These components have positive effects on soil decomposition, structure, texture, aeration, water-holding capacity, and aid in preventing soil erosion. Vermicompost is known for its excellent qualities in terms of porosity, aeration, drainage, and water-holding capacity. Nature has endowed it liberally to tolerate the drought and flood condition and adoptability to a wide range of soil and climatic conditions. Its cultural requirement is also very limited. Besides other factors of crop production, nutrients play an important role. It gives good response to manuring and fertilization in increasing fruit production (Singh, *et al.*, 2007).

Biofertilizers, also known as microbial inoculants, are preparations containing live or dormant cells of efficient strains of microorganisms. These biofertilizers are a low-cost renewable energy source that plays an important role in reducing inorganic fertilizer application while also increasing flower quality and yield while maintaining soil fertility.

To improve guava production, fertilizer management is vital. The macronutrients like nitrogen, phosphorus and potassium play a crucial role in promoting the plant growth, vigour and productivity, whereas micronutrients like zinc, iron, copper, manganese and boron have specific functions in growth, development, quality produce and uptake of nutrients. It is reported that application of organics and chemical fertilizers not only increased the yield, but also improved the fruit quality in guava (Naik and Hari Babu, 2007).

Materials and Methods

The present research work entitled "Effect of Integrated Nutrient Management (INM) in Guava (*Psidium guajava* L.) cv. Allahabad Safeda" was conducted with twelve treatments involving various combinations of RDF, FYM, vermicompost, and biofertilizers (Azotobacter and PSB) were tested in a Randomized Block Design (RBD) with three replications. Observations were recorded on Yield parameters: Length of the fruit (cm), Width of the fruit (cm), 100 Seed weight (gm), Number of seeds per fruit, No. of fruits per tree, fruit weight (gm) Total fruit yield (kg/tree) Fruit yield (q/ha).

The treatment combinations applied are given as under:

Tr. No.	Treatments
T_1	Absolute control
T_2	500g: 200g: 500g NPK /Tree
T_3	T_{1+} Zn (0.5%) + B (0.2%) + Mn (1%) as foliar spray twice (August and October)
T_4	T1 +Organic mulching @10 cm thick
T_5	T 2 + Organic mulching @10 cm thick
T_6	50 percent dose of recommended fertilizers + 25 kg FYM + 250 g Trichoderma
T_7	50 percent dose of recommended fertilizers + 50 kg FYM + 250 g Azospirillum
T_8	50 percent dose of recommended fertilizers + 50 kg FYM + 250 g Azotobacter
T_9	50 percent dose of recommended fertilizers + 25 kg FYM + 5kg vermicompost
T_{10}	50 percent dose of recommended fertilizer + 25 kg FYM + 250 g Pseudomonas florescence
T_{11}	50 percent dose of recommended fertilizer + 25 kg FYM + 250 g Trichoderma + 250 g Pseudomonas
T_{12}	50 percent dose of recommended fertilizer + 25 kg FYM + 250 g Aspergillus Niger

Experimental site

The experiment was carried out at Fruit Research Station Farm, Kuthuliya, Rewa (M.P), by the Department of Horticulture in the year 2024. Rewa is situated in the north-eastern part of Madhya Pradesh at latitude 20°21 N, longitude 81°15' E and altitude of 365.7 m above the mean sea level. The minimum and maximum temperature occasionally reaches 7.13°C and 40.77°C respectively.

Results and Discussion

Length of the fruit (cm)

The data in the table clearly show that the treatments significantly affected the length of the fruit. The highest length of the fruit (7.25cm) was achieved with treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). Significantly outperforming all other treatments except T_{10} (50% dose of recommended fertilizer + 25kg FYM + 250g Pseudomonas florescence) which length of the fruit (7.06cm) and T_3 (T_1 +Zn (0.5%) + B (0.2%) + Mn (1%) as foliar spray twice (August and October) (7.05cm). The minimum length of the fruit (3.25cm) was observed in T_1 (Absolute control). The results have been supported by Bashir *et al.*, (2009) in guava Chakraborty *et al.*, (2008) in guava.

Width of the fruit (cm)

Statistical analysis of the data in the table indicates a

Table 1: Effect of Integrated Nutrient Management on Yield parameters of the fruit of guava.

Tr. No.	LTF	WTF	NSPF	100 SW
T_1	3.25	4.39	230.33	0.8
T_2	6.23	7.09	225.5	1.04
T_3	7.05	7.28	223.9	1.26
T_4	6.01	6.02	229.8	1.06
T_5	5.99	6.39	228.6	1.13
T_6	6.39	6.91	218.6	1.1
T_7	6.05	7.02	225.11	1.13
T_8	6.29	6.85	215.13	1.15
T_9	7.25	7.99	205.22	1.37
T_{10}	7.06	7.29	208.32	1.3
T_{11}	6.34	6.32	212.02	1.14
T_{12}	5.47	5.86	222.6	1.16
S.E m ±	**0.28**	**0.30**	**4.72**	**0.06**
CD at 5%	**0.83**	**0.88**	**13.86**	**0.19**

LTF: Length of the fruit (cm); **WTF:** Width of thefruit (cm); **NSPF:** Number of seeds per fruit; **100 SW:** 100 Seedweight (gm)

significant impact of the various treatments on the width of guava fruits. The highest width of the fruit (7.99 cm) was observed under treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). which was significantly greater than all other treatments except T_{10} (50% dose of recommended fertilizer + 25kg FYM + 250g Pseudomonas florescence) with an average of (7.29cm) and T_3 (T_1 +Zn (0.5%) + B (0.2%) + Mn (1%) as foliar spray twice (August and October)) (7.28cm) The minimum increase in width of the fruit was recorded to be (4.39cm) under T_1 (Absolute control). The results have been supported by Dwivedi V. (2013).

Number of seeds per fruit

The data in the table clearly indicate that the treatments significantly influenced the number of seeds per guava fruit. The fewest seeds per fruit (205.22) were found in treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). Which was significantly lower than all other treatments. But was found to be at par with T_{10} (208.32) and T_{11} (212.02). The highest number of seeds per fruit (230.33) was observed

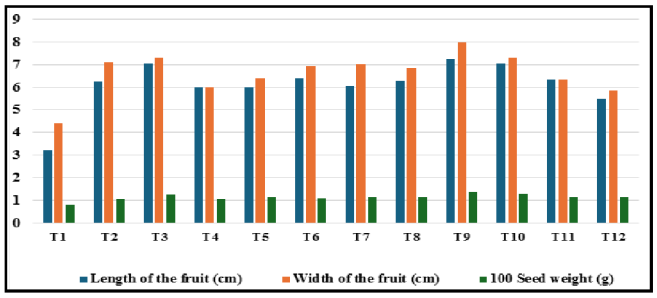

Fig. 1: Effect of Integrated Nutrient Management on Yield parameters of guava.

Table 2: Effect of Integrated Nutrient Management on Yield parameters of the fruit of guava.

Tr. No.	NFPP	WPF	YPP	YPH
T_1	190.3	169.33	21.67	95.6
T_2	204.8	183.36	33.63	141.6
T_3	227.3	223.49	39.25	166.6
T_4	194.9	202.4	31.19	130.5
T_5	207.8	204.06	35.87	144.4
T_6	220.4	206.01	38.3	159.9
T_7	210.6	203.64	34.08	142.8
T_8	213.3	197.05	37.3	166.4
T_9	237.6	226.43	48.26	179.6
T_{10}	230.6	225.74	47.27	175.9
T_{11}	210.8	195.16	32.65	142.3
T_{12}	227.2	186.66	38.5	153.7
S.E m ±	**3.57**	**2.62**	**0.77**	**3.97**
CD at 5%	**10.47**	**7.71**	**2.27**	**11.6**

NFPP: Number of fruits per plant; **WPF:** Weight per fruit (g); **YPP:** Yield per plant(kg); **YPH:** Yield per hectare (q)

in the T_1 (Absolute control). The results have been supported by Katiyar *et al.*, (2008) in guava.

100 Seed weight (gm)

Treatments on the 100 Seed weight of guava fruits. The highest average 100 Seed weight (1.37gm) was observed under treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). Which was significantly greater than all other treatments except T_{10} (50% dose of recommended fertilizer + 25kg FYM + 250g Pseudomonas florescence) with an average of (1.30gm) and T_3 (T_1 + Zn (0.5%) + B (0.2%) + Mn (1%) as foliar spray twice (August and October) (1.26gm) The minimum increase in Seed weight was recorded to be (0.8gm) under T_1 (Absolute control). The results have been supported by Kaur G. (2017). Kumar *et al.*, (2007) in mango.

Number of fruits per plant

The data in the table clearly show that the treatments significantly affected the number of fruits per plant. Treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost) resulted in the highest number of fruits (237.6). significantly more than all other

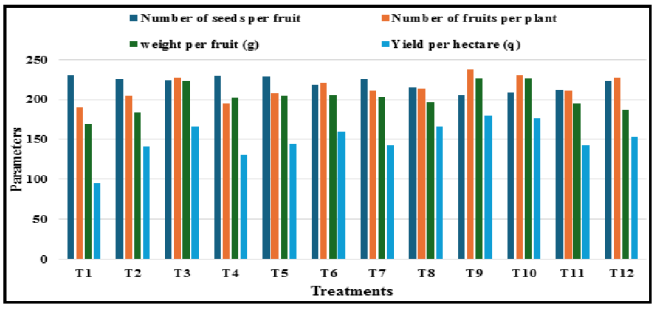

Fig. 2: Effect of Integrated Nutrient Management on Yield parameters of guava.

treatments except T_{10}, T_{12} and T_3 with 230.6, 227.2 and 227.3. The minimum number of fruits per plant (190.3) was observed in T_1(Absolute control). The results have been supported by Kundu *et al*., (2007) in guava.

Fruit weight (gm)

Statistical analysis of the data in the table indicates a significant impact of the various treatments on the weight of guava fruits. The highest average fruit weight (226.43g) was observed under treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). Which was significantly greater than all other treatments except T_{10} (50% dose of recommended fertilizer + 25kg FYM + 250g Pseudomonas florescence) with an average of (225.74g) and T_3 (T_1 +Zn (0.5%) + B (0.2%) + Mn (1%) as foliar spray twice (August and October) (223.49). The minimum increase in fruit weight was recorded to be (169.33g) under T_1 (Absolute control). The results have been supported by Mangal *et al*., (2020) in guava. Rathod *et al*., (2022) in mango.

Total fruit yield (kg/tree)

The data in the table clearly indicate that the treatments significantly impacted the yield per guava plant. The highest yield per plant (48.26kg) was achieved with treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). Significantly outperforming all other treatments except T_{10} (50% dose of recommended fertilizer + 25kg FYM + 250g Pseudomonas florescence). Which yielded (47.27kg) per plant. The lowest yield per plant (21.67kg) was observed in the T_1 (Absolute control). The results have been supported by Reddy *et al*., (2021) in strawberry, Sharma *et at*., (2005) in litchi.

Fruit yield (q/ha)

The data in the table clearly show that the treatments significantly affected the yield of guava per hectare. The highest yield per hectare (179.6q) was achieved with treatment T_9 (50% dose of recommended fertilizers + 25kg FYM + 5kg vermicompost). Significantly outperforming all other treatments except T_{10} (50% dose of recommended fertilizer + 25kg FYM + 250g Pseudomonas florescence) which yielded (175.9q) per hectare. The minimum yield per hectare (95.6q) was observed in T_1 (Absolute control). The results have been supported by Singh *et al*., (2007) in guava, Tyagi *et at*., (2021) in guava.

Acknowledgement

Authors acknowledge Department of Horticulture, JNKVV, College of Agriculture Rewa for providing necessary support and fundings to carry out this research work.

References

Bashir, Muhammad Azhar, Mushtaq Ahmad, Muhammad Raza Salik and Muhammad, Zaman Awan (2009). Manure and Fertilizers Effect on Yield and Fruit Quality of Guava (*Psidium guajava* L.). *J. Agric. Res*. **47(3)**, 247.

Chakraborty, B., Tiwari J.P., Lal Shant and Kumar Raj (2008). Effect of organic manure and mulching on growth, yield and quality of winter season crop of guava (*Psidium guajava* L.) *cv*. Pant Prabhat. *Pant nagar J. Res*.**6(2)**, 239-242.

Dwivedi, V. and Agnihotri S. (2018). Effect of Integrated Nutrient Management on Growth, Yield and Economics of Guava (*Psidium guajava* L.) *cv*. Allahabad afeda. *Int. J. Curr. Microbial. App. Sci*. **7(6)**, 3449-3453.

Katiyar, P.N., Singh J.P. and Singh P.C. (2008). Effect of nitrogen with and without zinc and organic manure on growth, yield and quality of guava (*Psidium guajava* L.) cv. Sardar. *Asian J. Horti*. **3(2)**, 283-286.

Kaur, G. (2017). Effect of inorganic and organic fertilizers on fruit quality and yield attributes in guava cv. Sardar. *Int. J. Adv. Res*. **5(12)**, 1346-1351.

Kumar, P., and Rehalia AS. (2007). Standardization of micronutrient ranges in mango (*Mangifera indica* L.) by orchard survey. *The sian J. of Hort*., **2(1)**, 218-221.

Kundu, S., Ghosh B., Mitra S.K. and Mazumdar D. (2007). Effect of foliar spraying of nitrogen, phosphorus and potassium on yield and fruit quality of guava (*Psidium guajava* L.). *Acta Hor*t. **735**, 433-440.

Mangal, S., Singh S.S., Kumar S. and Rangare N.R. (2020). Impact of inorganic, organic and bio-fertilizers on growth and yield of guava (*Psidium guajava* L.). *International Journal of Chemical Studies*, **8(6)**, 101-107.

Naik, M.H. and Sri Hari Babu R. (2007). Feasibility of Organic Farming in Guava (*Psidium guajava* L.). *Acta Hort*. **735**, 365-372.

Rathod, K.D., Patel M.J., Macwan S.J. and Patel J.S. (2022). Effect of Biofertilizers and Bioinoculants on Yield and Quality of Mango *cv*. Mallika. *Biological Forum– An International Journal*, **14(3)**, 1343-1349.

Reddy, K.C.K., Reddy P.V.K., Raghuteja P.V. and Sekhar V. (2021). Integrated nutrient management on quality and yield of strawberry fruits (*Fragaria* × *ananassa*Duch.) *cv*. Camarosa under shade net conditions. *International Journal ofAgricultural Sciences*, **17**, 74-78.

Sharma, P.S., Singh A.K. and Sharma R.M. (2005). Effect of plant Bioregulators (PBRs) and micronutrient on fruit set and quality of Litchi cv. Dehradun. *Indian J. Horti*. **62(1)**, 24-26.

Singh Virendra, Dashora L.K., Rathore R.S. and Meena C.L. (2007). Flowering and Yield of Guava (*Psidium guajava* L.) *cv*. "Sardar" as Influenced by Various Organic and Inorganic Sources. *Curr. Agric*. **31(1-2)**, 67-71.

Tyagi S.K., Kulmi G.S. and Khire A.R. (2021). Effect of integrated nutrient management on growth, yield and economics of guava (*Psidium guajava* L.). *J Krishi Vigyan* **10(1)**, 69-72.

Varghese, M.J., Paul P.K., Ashiba A., Sudhakar S. and Marimuthu R. (2023). Assessing the effect of integrated nutrient management in Nendran banana. *The Pharma Innovation Journal*, **12(1)**, 1385-1386.

Verma, M.L., Bhardwaj S.P., Thakur B.C. and Bhandari A.R. (2005). Nutritional and mulching studies in apple. *Indian J. Hort*., **62(4)**, 332-335.