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EFFECT OF PLANT GROWTH REGULATORS AND MICRONUTRIENTS ON YIELD ATTRIBUTES OF GUAVA (*PSIDIUM GUAJAVA* L.) CV. L-49

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ABSTRACT

The present investigation entitled "Studies on effect of foliar feeding of micronutrients and plant growth regulators on fruiting behaviour, yield, quality and storability of Guava (*Psidium guajava* L.) fruits cv. L-49" was carried out during the year 2023-24 and 2024-2025 at Main Experiment Station, Department of Horticulture, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh, India. The treatments comprised of the spraying of different PGRs and micronutrients to study the yield attributes of guava fruits cultivar L-49. The experiment was conducted in randomized block design (RBD) with eleven treatments and three replications. The experiment consisted of eleven treatments including T_1 (Control), T_2 ($ZnSO_4$ 0.5%), T_3 (Borax 0.5 %), T_4 (NAA 40 ppm), T_5 (GA_3 40 ppm), T_6 ($ZnSO_4$ @ 0.5 % + Borax @ 0.5%), T_7 ($ZnSO_4$ 0.5% + NAA 40 ppm) T_8 ($ZnSO_4$ 0.5% + GA_3 40 ppm), T_9 (Borax 0.5% + NAA 40 ppm) T_{10} (Borax 0.5% + GA_3 40 ppm) T_{11} (GA_3 40 ppm + NAA 40 ppm) Were used for this study. The maximum fruit weight (217.05 g), maximum fruit length (9.35 cm), maximum fruit Width (6.15 cm), maximum fruit volume (196.16 cc), maximum fruit specific gravity (1.19) and highest fruit yield per plant (45.64 kg) were observed with the foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm) under the agroclimatic condition of Eastern Uttar Pradesh of India.

INTRODUCTION

Guava (*Psidium guajava* L.) "Apple of the tropics" belongs to family Myrtaceae and is a highly remunerative fruit crop. The basic chromosome number is 2n=11 and the diploids have 2n=22. It is an important fruit of Tropical and Subtropical areas of the world and was introduced in India in the 17th century by the Portuguese. Guava is classed in the genus Psidium, which contains 150 species (Hayes, 1970), but only Psidium guajava L. has been extensively cultivated. The vast majority of guava species produce fruit. It originates in Tropical America (Peru) and is grown as a wild bush. It is one of the country's most important fruit crops, not because of its large area or production, but because of its wider edapho-climatic adaptability, hardiness to various biotic and abiotic stresses, precocious and prolific bearing habit, quality fruit with high nutritive value, medicinal properties, fresh fruit, and suitability for various value-added products.

Guava fruit is noted for its "Vitamin-C" and minerals such as calcium, iron, and phosphorus, as well as its pleasant aroma and flavour. The nutritional value of guava is very high. As a result, it is an excellent fruit for maintaining good nutrition. Guava is one of the cheapest and most nutritious sources of vitamin C (210-305mg/100g fruit pulp) and pectin (0.5-1.8%), although it is low in energy (66cal/100g). The ripe fruits have 12.3-26.3% dry matter, 77.9-86.9% moisture, 0.51-1.02% ash, 0.10-0.70% crude fat, 0.82-1.45% crude protein, and 2.0-7.2% crude fibre. The fruit pulp is also high in minerals such as phosphorus (22.5-40.0 mg/100g pulp), calcium (10.0-30.0 mg/100g pulp), iron (0.60- 1.39 mg/100g pulp), pantothenic acid, thiamine (0.03-0.07 mg/100g pulp), riboflavin (0.02-0.04 mg/100g pulp), and vitamin A (Mitra and Bose, 2001).

Micronutrients are essential for proper plant growth and development, as they play important roles in a variety of enzymatic activities and synthesis. Severe deficits in these micronutrients can occasionally cause irreparable damage (Kumar, 2002). Furthermore, micronutrients aid in major nutrient absorption and are essential to many metabolic processes within plants, including cell wall biosynthesis, metabolic respiration, photosynthetic activity, chlorophyll biosynthesis, enzymatic function, hormone production, and nitrogen integration (Das, 2003). Plant growth regulators are organic compounds, other than nutrients, that in small amounts promote, inhibit, or otherwise change any physiological response in plants. Gibberellins are compounds that enhance plant development by processing the gibbane ring structure. Mahmood *et al.* (2016) found that gibberellins improved fruit set, ascorbic acid levels, and T.S.S. in guavas. NAA is a key auxin growth regulator that contributes to reduced fruit drop and improved fruit set. NAA reduces the amount of seeds in the fruits. It also encourages heavier fruits and flowering (Meena *et al.,* 2022). The aims of this experiment are to assess the influence of nutrient foliar feeding on guava fruit yield attributes.

MATERIAL AND METHODS

The experiment titled Studies on effect of foliar feeding of micronutrients and plant growth regulators on fruiting behaviour, yield, quality and storability of Guava (*Psidium guajava* L.) fruits cv. L-49 was carried out during 2023-24 and 2024-2025 at the Main Experiment Station of Horticulture, Acharya Narendra Deva University of Agriculture and Technology

(ANDUAT), Kumarganj, Ayodhya. It involved ten-year-old L-49 guava plants planted at a spacing of 6 m × 6 m. The eleven treatments details are T_1 (Control), T_2 ($ZnSO_4$ 0.5%), T_3 (Borax 0.5 %), T_4 (NAA 40 ppm), T_5 (GA_3 40 ppm), T_6 (ZnSO4 @ 0.5 % + Borax @ 0.5%), T_7 ($ZnSO_4$ 0.5% + NAA 40 ppm) T_8 (ZnSO4 0.5% + GA_3 40 ppm), T_9 (Borax 0.5% + NAA 40 ppm) T_{10} (Borax 0.5% + GA_3 40 ppm) T_{11} (GA_3 40 ppm + NAA 40 ppm). A Randomized Block Design with eleven treatments and three replications was involved, and nutrient sprays were applied twice in both year (2023-24 and 2024-2025) once prior to flowering in and once after fruit set**.** At Flowering and fruit setting stage, plant growth regulators and micronutrients were sprayed into the leaves of each treatment to give a homogeneous spray over the whole guava plant treatment.

Fruit weight (g):-

The weight of representative fruits of each treatment from each plant was recorded and average weight (g) per berry was worked out.

Fruit length (cm): -

The length of each of five mature fruits from each replication was measured with the help of Vernier Calipers and the average length of fruit was calculated and expressed in centimeter.

Fruit width (cm): -

Fruit diameter of five randomly selected fruits per replication was measured from shoulders of the berries with the help of digital vernier callipers and mean breadth was calculated in centimeter.

Fruit volume (cc): -

The volume was determined using the water displacement method. A wide-mouth measuring cylinder was partially filled with water, and the initial volume was recorded. The fruit was then placed into the cylinder, and the final volume was measured. The fruit's volume was calculated as difference between the initial and final readings.

Specific gravity: -

Specific gravity of guava fruits was calculated by the following formula,

$$\text{Specific gravity} = \frac{\text{Weight of the fruit (g)}}{\text{Volume of the fruit (cc)}}$$

Yield per plant (kg):-

Yield per plant was calculated by weighing the total fruits harvested from each plant across all harvesting dates using a weighing machine, and the value was expressed in kilograms per plant.

RESULTS AND DISCUSSIONS

Fruit Weight (g)

The data in Table 1 shows the effect of micronutrients and plant growth regulators on fruit weight during both the years (2023-24 and 2024-25) of investigation. During 2023-24, the maximum fruit weight of 218.67g was recorded with foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm), which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatments with 200.11g fruit weight. However, the minimum fruit weight of 138.67g was recorded under control (T_1).

Similar trend was also noted in 2024-25 and the maximum significant increase in the fruit weight of 215.42g was observed in T_{11} (GA_3 40 ppm + NAA 40 ppm). This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatments with 198.90g fruit weight. While the minimum fruit weight of 136.64g was observed in control (T_1).

Pooled data reveals that all the treatments increased fruit weight significantly over the control. The maximum fruit weight of 217.05g was recorded in plants sprayed with GA_3 40 ppm + NAA 40 ppm (T_{11}). Which was followed by T_{10} (Borax 0.5% + GA_3 40 ppm) treatments with 199.51g fruit weight. The lowest fruit weight of 137.66g was recorded in control (T_1). The increases in weight of fruit in T_{11} was significant over rest treatments including control.

The present findings regarding the increase in fruit weight with the application of micronutrients and plant growth regulators may be due to enhanced cell division and cell elongation, improved nutrient partitioning towards developing fruits, and better hormonal balance. The increase in the weight of the fruit might be due to stimulation of cell division and elongation in the young ovary and improving the translocation of assimilates. Similar findings were also noted by Sonam *et al.* (2022) in guava, Sharma *et al.* (2025) in guava, Masood *et al.* (2025) in guava, Shukla *et al.* (2025) in guava and Suman *et. al.* (2021) in guava.

Fruit Length (cm)

A perusal of Table 1 shows significant influence of micronutrients and plant growth regulators on fruit length during both the years of investigation. During 2023-24, the maximum fruit length of 9.33 cm was noted with the foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm), which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 8.70 cm fruit length. However, the minimum fruit length of 6.01 cm was recorded under control (T_1).

During 2024-25, similar trend was observed and the maximum fruit length of 9.38 cm was recorded in T_{11} (GA_3 40 ppm + NAA 40 ppm) which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 8.73 cm fruit length. While the minimum fruit length of 6.01 cm was observed in control (T_1).

Pooled data in Table 1 shows that all the treatments increased fruit length significantly over the control. The maximum fruit length of 9.35 cm was recorded in plants sprayed with GA_3 40 ppm + NAA 40 ppm (T_{11}), which was significantly superior over all other treatments. It was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 8.72 cm fruit length. The lowest fruit length of 6.01 cm was recorded in control (T_1).

Micronutrients and plant growth regulators played significant role in fruit growth and development, particularly in enhancing fruit length through improved cell division and elongation processes in various fruit crops including Guava. In conformity to our findings, Sonam *et al.,* (2022) in guava, Sharma *et al.* (2025) in guava, Masood *et al.* (2025) in guava, Shukla *et al.* (2025) in guava and Suman *et al.* (2021) in guava.

Fruit Width (cm)

A perusal of Table 1 shows significant influence of micronutrients and plant growth regulators on fruit width during both the years of investigation. During 2023-24, the maximum fruit width of 6.15 cm was recorded with foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm), which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 5.87 cm fruit width. However, the minimum fruit width of 3.72 cm was recorded under control (T_1).

Similar trend was also noted in 2024-25 and the maximum fruit width of 6.15 cm was observed in T_{11} (GA_3 40 ppm + NAA 40 ppm) which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 5.86 cm fruit width. While, the minimum fruit width of 3.73 cm was observed in control (T_1).

Pooled data represents that all the treatments increased fruit width significantly over the control. The maximum fruit width of 6.15 cm was recorded in plants sprayed with GA_3 40 ppm + NAA 40 ppm (T_{11}), which was significantly superior over all other treatments. It was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 5.87 cm fruit width. The lowest fruit width of 3.72 cm was recorded in control (T_1). In conformity to our findings, Sonam *et al.* (2022) in guava, Sharma *et al.* (2025) in guava, Masood *et al.* (2025) in guava, Shukla *et al.* (2025) in guava and Suman *et al.,* (2021) in guava.

Fruit volume (cc)

The data presented in Table 2 demonstrate that different treatments significantly influenced the fruit volume (cc) of Guava at various harvesting stages during the 2023-24 and 2024-25 growing seasons.

During the 2023-24 season, Treatment T_{11} (GA_3 40 ppm + NAA 40 ppm) yielded the maximum fruit volume of 195.81 cc, followed closely by T_{10} (Borax 0.5% + GA_3 40 ppm) with 181.76 cc at the same developmental stage. In contrast, the minimum fruit volume (140.02 cc) was observed under the control treatment (T_1) at the final harvesting stage.

Similarly, in the subsequent year 2024-25, the fruit volume progressively increased with the advancement of harvesting stages. The maximum fruit volume was recorded at with the highest value of 196.50 cc observed under T_{11} (GA_3 40 ppm + NAA 40 ppm), followed by T_{10} (Borax 0.5% + GA_3 40 ppm) with a fruit volume of 181.89 cc. The lowest fruit volume was recorded under T_1 (Control) with a value of 138.34 cc.

Pooled data represents that all the treatments increased fruit volume significantly over the control. The maximum fruit volume of 196.16 cc was recorded in plants sprayed with GA_3 40 ppm + NAA 40 ppm (T_{11}), which was significantly superior over all other treatments. It was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 181.82 cc fruit volume. The lowest fruit volume of 139.18 cc was recorded in control (T_1).

The volume of fruits increased steadily throughout the entire growth period, with a more pronounced expansion observed during the later stages of fruit development. This increase in volume can be attributed to the accelerated accumulation of metabolites, enhanced cell elongation, and improved cell division facilitated by the synergistic action of growth regulators and micronutrients. The combined application of GA_3 and NAA, along with micronutrients like zinc and boron, appeared to optimize physiological processes leading to superior fruit volumetric growth. A similar continuous rise in fruit volume has been reported Sonam *et al.* (2022) in guava, Sharma *et al.* (2025) in guava, Masood *et al.* (2025) in guava, Shukla *et al.* (2025) in guava and Suman *et al.,* (2021) observed an increase in fruit volume in guava.

Specific Gravity

The data has been presented in Table 2 which reveals the effect of micronutrients and plant growth regulators on fruit specific gravity during both the years (2023-24 and 2024-25) of study. During 1st year (2023-24), the maximum fruit specific gravity of 1.19 was noted with the foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm), which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 1.17 fruit specific gravity. However, the minimum fruit specific gravity of 0.95 was recorded under control (T_1).

Similarly, in 2nd year (2024-25), the maximum fruit specific gravity of 1.19 was recorded with T_{11} (GA_3 40 ppm + NAA 40 ppm), which was significantly superior over rest of the treatments. It was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 1.16 fruit specific gravity. However, the lowest fruit specific gravity of 0.94 was noted under control (T_1).

The pooled data presented in Table 2 reveals that the significantly higher fruit specific gravity of 1.19 in comparison to all other treatments was observed in plants sprayed with T_{11} (GA_3 40 ppm + NAA 40 ppm) which was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatments with 1.17 fruit specific gravity. The minimum fruit specific gravity of 0.95 was observed in control (T_1).

Effect of micronutrients and Plant growth regulators observed significant improvement in fruit specific gravity with attributing it to enhanced dry matter accumulation and improved tissue composition. Similar findings were also reported by Sonam *et. al.,* (2022) in guava, Sharma *et al.* (2025) in guava, Masood *et al.* (2025) in guava, Shukla *et al.* (2025) in guava and Suman *et al.,* (2021) in guava.

Yield per Plant (kg)

The data in Table 2 shows the significant effect of micronutrients and plant growth regulators on yield per plant during both the years (2023-24 and 2024-25) of investigation.

During 2023-24, the maximum yield of 45.81 kg per plant was recorded with foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm), which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 40.17 kg per plant yield. However, the minimum yield of 22.09 kg per plant was recorded under control (T_1).

Similar trend was also noted in 2024-25 and the maximum yield of 45.47 kg per plant was observed in T_{11} (GA_3 40 ppm + NAA 40 ppm) which was significantly superior over rest of the treatments. This was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 40.21 kg per plant yield. While the minimum yield of 22.02 kg per plant was observed in control (T_1).

Pooled data reveals that all the treatments increased yield per plant significantly over the control. The maximum yield of 45.64 kg per plant was recorded in plants sprayed with GA_3 40 ppm + NAA 40 ppm (T_{11}), which was significantly superior over all other treatments. It was followed by T_{10} (Borax 0.5% + GA_3 40 ppm), treatment with 40.19 kg per plant yield. The lowest yield of 22.05 kg per plant was recorded in control (T_1).

The highest fruit yield recorded by foliar spray of micronutrients and plant growth regulators may be attributed to better uptake and mobilization of nutrients to sink, improved hormonal balance, enhanced photosynthetic efficiency, and superior fruit quality parameters leading to better fruit development and retention. These findings are also supported by the results, Suman *et al.* (2021) in guava, Sonam *et al.* (2022) in guava, Sharma *et al.* (2025) in guava, Masood *et al.* (2025) in guava, Shukla *et al.* (2025) in guava and Suman *et. al.,* (2021) who reported significant improvement in fruit yield with the application of micronutrients and plant growth regulators in guava fruit.

Table-1 Effect of Plant growth regulators and micronutrients on Fruit Weight, Fruit Length and Fruit Width of Guava cv. L-49.

Treatments	Fruit Weight (g)			Fruit Length (cm)			Fruit Width (cm)		
	2023-2024	2024-2025	Pooled	2023-2024	2024-2025	Pooled	2023-2024	2024-2025	Pooled
T_1: Control	138.67	136.64	137.66	6.01	6.01	6.01	3.72	3.73	3.72
T_2: $ZnSO_4$ 0.5%	151.33	147.50	149.42	6.30	6.26	6.28	4.06	4.06	4.06
T_3: Borax 0.5%	154.12	152.60	153.36	6.35	6.33	6.34	4.25	4.25	4.25
T_4: NAA 40 ppm	169.50	165.13	167.32	6.42	6.36	6.39	4.64	4.67	4.65
T_5: GA_3 40 ppm	160.47	161.97	161.23	6.80	6.69	6.74	4.85	4.85	4.85
T_6: $ZnSO_4$ 0.5% + Borax 0.5%	175.53	174.73	175.13	7.03	6.97	7.00	5.03	5.03	5.03
T_7: $ZnSO_4$ 0.5% + NAA 40 ppm	174.90	174.43	174.67	6.85	6.83	6.84	5.26	5.25	5.26
T_8: $ZnSO_4$ 0.5% + GA_3 40 ppm	180.81	178.53	179.67	7.75	7.60	7.68	5.47	5.41	5.44
T_9: Borax 0.5% + NAA 40 ppm	186.15	186.17	186.16	8.50	8.33	8.42	5.65	5.68	5.66
T_{10}: Borax 0.5% + GA_3 40 ppm	200.11	198.90	199.51	8.70	8.73	8.72	5.87	5.86	5.87
T_{11}: GA_3 40 ppm + NAA 40 ppm	218.67	215.42	217.05	9.33	9.38	9.35	6.15	6.15	6.15
SEm±	2.98	2.41	2.61	0.12	0.12	0.11	0.45	0.60	0.46
CD at 5%	8.86	7.17	7.76	0.36	0.35	0.32	1.34	1.77	1.38

Table-2 Effect of Plant growth regulators and micronutrients on Fruit Volume, Specific Gravity and Yield per plant of Guava cv. L-49.

Treatments	Fruit Volume (cc)			Specific Gravity			Yield per plant (kg)		
	2023-2024	2024-2025	Pooled	2023-2024	2024-2025	Pooled	2023-2024	2024-2025	Pooled
T_1: Control	140.02	138.34	139.18	0.95	0.94	0.95	22.09	22.02	22.05
T_2: $ZnSO_4$ 0.5%	142.01	141.76	141.89	1.01	1.00	1.00	22.44	22.10	22.27
T_3: Borax 0.5%	144.30	144.01	144.16	1.04	1.03	1.04	24.07	24.07	24.07
T_4: NAA 40 ppm	148.90	148.54	148.72	1.05	1.03	1.04	24.83	24.49	24.66
T_5: GA_3 40 ppm	151.30	150.95	151.13	1.07	1.05	1.06	27.54	27.54	27.54
T_6: $ZnSO_4$ 0.5% + Borax 0.5%	173.43	174.43	173.93	1.09	1.07	1.08	29.95	30.04	29.99
T_7: $ZnSO_4$ 0.5% + NAA 40 ppm	151.24	150.72	150.98	1.07	1.07	1.07	32.88	32.24	32.56
T_8: $ZnSO_4$ 0.5% + GA_3 40 ppm	174.73	174.39	174.56	1.12	1.12	1.12	35.24	35.24	35.24
T_9: Borax 0.5% + NAA 40 ppm	178.58	177.58	178.08	1.16	1.13	1.15	37.53	36.25	36.89
T_{10}: Borax 0.5% + GA_3 40 ppm	181.76	181.89	181.82	1.17	1.16	1.17	40.17	40.21	40.19
T_{11}: GA_3 40 ppm + NAA 40 ppm	195.81	196.50	196.16	1.19	1.19	1.19	45.81	45.47	45.64
SEm±	2.19	1.99	2.07	0.02	0.02	0.02	0.59	0.53	0.50
CD at 5%	6.51	5.910	6.15	0.06	0.05	0.05	1.74	1.57	1.49

CONCLUSION

Based on the results of the present investigation, it can be concluded that foliar application of T_{11} (GA_3 40 ppm + NAA 40 ppm) was significantly superior to the control in enhancing yield Attributes of guava fruits. The T_{11} (GA_3 40 ppm + NAA 40 ppm) treatment effectively improved the fruit's growth and development. Additionally, it significantly improved parameters such as the fruit weight, Length, Width, Volume and yield per plant.

REFERENCES: -

Badal, D. S. and Tripathi, V. K. 2021. Effect of foliar application of NAA and Boron on physico-chemical parameters of winter season guava (*Psidium guajava* L.) cv. Lucknow-49. *The Pharma Innovation Journal*, 10(9):928-932.

Das, D.K. 2003. Micronutrients: Their behaviours in soils and plants. 2nd Ed., Kalyani Publication, Ludhiana, pp.1-2.

Gaund, M., Ram, D. and Kumar, A. 2022. Response of foliar application of micronutrients and plant growth regulator on Physio-chemical attributes of guava (*Psidium guajava* L.) cv. Shweta and Lalit. *The Pharma Innovation Journal,* 11(2):2809-2813.

Hayes, W. B. 1970. Fruit growing in India, Kitabistan Allahabad.

Khan, A. S., Nasir, M., Malik, A. U., Basra, S. M. A. and Jaskani, M. J. 2015. Effect of calcium, boron and zinc on the leaf mineral status, growth, productivity and fruit quality of 'Kinnow' mandarin (*Citrus nobilis* Lour x *Citrus deliciosa* Tenora). *Journal of Plant Nutrition*, 38(6):821-838.

Kumar, P. 2002. Managing micronutrient deficiency in ornamental crops. *Indian Horticulture*, 46:30-31.

Kumar, S. and Shukla, A. K. 2010. Improvement of old ber cv. Gola orchard through bunding and micro-nutrients management. *Indian Journal of Horticulture,* 67(3):322-327.

Mahmood, S., Hasan, M. N., Ali, S. Y., Ripa, R. A., and Hossain, M. G. 2016. Effect of plant growth regulators on fruit-set and quality of guava. *Turkish Journal of Agriculture-Food Science and Technology*, 4(12):1088-1091.

Masood, S., Ali, L., Hussain, T., Liaquat, M., Aon, M., ur-Rehman, A. and Zafar-ul-Hye, M. 2025. Foliar application of gibberellic acid and boric acid enhances boron translocation in leaves and improves the yield of guava (*Pisidium gujava* L.) cv. Sada Bahar Gola. *Journal of Plant Nutrition,* 48(7):1228-1244.

Meena, S., Kumar, S., Meena, R. K. and Divakar, N. 2022. Effect of foliar spray of micronutrients and plant growth regulators on growth and yield parameter of guava (*Psidium guajava* L.) cv. L-49. *The Pharma Innovation Journal*, 11(5):1875-1877

Mitra, S.K. and Bose, T.K. 2001. Guava *In* Bose, T.K. and D. Sanyal (ed) Fruits: Tropical & Sub tropical VI. *Naya udyog*, Calcutta. pp. 610-611.

Sharma, A., Topno, S. E., Prasad, V. M. and Raj, S. 2025. Effect of Foliar Application of Various Micronutrients on Fruit Yield and Quality Attributes of Guava. *International Journal of Environment and Climate Change*, 15(2):174-181.

Shukla, J. K., Kumar, S., Kashyap, M., Choudhary, K., Baloda, S., Saini, A. K. and Saha, A. 2025. Foliar Feeding of Micro-Nutrient Influencing Physical Attributes of Winter Season Guava (*Psidium guajava* L.) cv. L-49. *International Journal of Plant & Soil Science*, 37(11):204-210.

Shukla, J. K., Kumar, S., Kashyap, M., Choudhary, K., Baloda, S., Saini, A. K. and Saha, A. 2025. Foliar Feeding of Micro-Nutrient Influencing Physical Attributes of Winter Season Guava (*Psidium guajava* L.) cv. L-49. *International Journal of Plant & Soil Science*, 37(11):204-210.

Shukla, U., Lata, R., Yadav, S. and Kumar, P. 2022. Effect of Foliar Spray of Micronutrients on Physical Parameters of Guava (*Psidium guajava* L.) cv. Allahabad Safeda. *Indian Journal of Commerce,*14(1):109-111

Sonam Meena, Sanjay Kumar, Rajesh Kumar Meena and Nikita Divaker. 2022. *The Pharma Innovation Journal.* 11(5): 1875-1877

Suman, A., Singh, A. K., Kanth, N. and Kumar, A. 2021. Effect of foliar feeding of micronutrients and plant growth regulators on flowering and physical parameter of Guava (*Psidium guajava* L.) cv. Allahabad Safeda under agroecological: Condition of north Bihar. *The Pharma Innovation Journal,* 10(9):483-486.

Trivedi, N., Singh, D.; Bhadur, V., Prasad, V.M. and Collis, J.P. 2012. Effect of application of zinc and boron on yield and quality of guava (*Psidium guajava* L.). *HortFlora Research Spectrum*, 1(3):281-283.

Ulemale PH, Tambe TB 2015. Variability in growth parameters of red fleshed and white fleshed guava genotypes. *The Bioscan*, 10(2):885-887.