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Effect of foliar application of micronutrients on Bio-chemical attributes of winter season guava (*Psidium guajava* L) cv. Lalit

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Abstract
A field experiment was conducted during 2016 at Horticulture Research Farm -1, BBAU, Lucknow on 8-year-old guava trees, to study the Effect of foliar application of micronutrients on Bio-chemical attributes of winter season guava (*Psidium guajava* L.) cv. Lalit."**,** results revealed that total soluble solid, acidity, ascorbic acid, reducing sugar, non-reducing sugar, total sugars were maximum when foliar spray was done with 1% zinc sulphate and 1% borax respectively.

Keywords: guava, zinc, borax, bio-chemical attributes, lalit

Introduction
In India Guava (*Psidium guajava* L.) cv. Lalit is one of the most important tropical and sub-tropical fruit crops which belongs to the family Myrtaceae. It is native of tropical America, stretching from Mexico to Peru and gradually become a commercial significance level of fruit crop in a several countries. In India, it has been introduced in early 17th century and gradually become a commercial crop all over the country. It is highly tolerant to alkaline and saline soil and it can be grown successfully even up to P^H 8.5, It can with stand to the maximum temperature at 46^0C, even with scantly annual rainfall of less than 25 cm. The guava bears flower and fruits on current season growing twigs and highly cross pollinated crop and pollination occurs through insects, especially honey bees. Fruits of guava developed from inferior ovary and exhibited double sigmoid growth curve. Fruit is many seeded berry. The fruit takes, nearly 4-5 months from flowering to maturity. The fruits colour change on maturity from dark green to yellowish green. The fruit is highly perishable and seasonal in nature. Mature fruits of guava are rich in vitamins, minerals and other nutrients. Guava fruit is considered as one of the delicious fruit. The nutritive value of guava is very high. Therefore, it is an ideal fruit for nutritional security with taste colour and aroma. Guava is one of the cheapest and good sources of vitamin-C (212 mg/100g), acidity (0.5-1.8%) and pectin (0.78%) which offers scope for processing industries. Guava fruit contains 82.5% water,10-12 (^{0}Brix), 2.45% reducing sugars, 2.23% non-reducing sugar, 0.48% ash of fruit pulp as well as good amount of iron, calcium and phosphorous. These fruits are consumed either fresh or processed in the form of products like jam, jelly, cheese, juice, nectar, ready to serve (RTS) etc. Among the trace elements zinc and boron play significant role in flowering and fruiting process, N-metabolism, hormonal movement and cell division. Boron and zinc increase the fruit set reduce fruit drop and improve fruit quality in various fruit crops (El. Sherif *et al*.,1997) [3]. The present investigation was, therefore, undertaken to study the effect of foliar application of micronutrients on Bio-chemical attributes of winter season guava (*Psidium guajava* L.) cv. Lalit."

Materials and Methods
8-year-old uniform guava plants of Lalit cultivar planted at 6x6 m a part growing in Horticulture Research Farm -1 of Babasaheb Bhimrao Ambedkar University Lucknow-226025 were taken for investigation. Zinc sulphate 0.5%(T_1),Zinc sulphate1% (T_2), Borax 0.5%(T_3), Borax 1%(T_4),Zinc sulphate 0.5% + Borax 0.5%(T_5), Zinc sulphate 0.5%+ Borax 1%(T_6), Zinc sulphate 1% + Borax 0.5%(T_7) Zinc sulphate 1%+ Borax 1%(T_8) along with Control(T_0). Were sprayed first week of August and repeated in second week of September during 2016.The experiment was laid out in R.B.D. with three replications. Both the minerals were applied through foliar feeding. Observations were recorded for total soluble solids, acidity, ascorbic acid, reducing sugar, non-reducing sugar and total sugars. The data so obtained were analysed statically.

Results and Discussion

A perusal of data in Table.1 shows that significant response in the maximum total soluble solids (11.18 ^{0} Brix) were recorded with foliar spray of zinc sulphate 1% + borax 1% followed by zinc sulphate 1% + borax 0.4%. Increase in the total soluble solids might be that boron and zinc helps in transmembrane sugar transport which may be possible cause for improvement in borax and zinc sulphate spray of trees. A notabled characteristic of borax is that it directly affects the photosynthesis activity of plant (Lal and Patil, 1948). These results are in close conformity with Awasthi and Lal (2009) [1] and Singh *et al.* (2004) [8] in guava.

The present study indicates that acidity content of guava fruit was significantly decreased by different treatment. While, it was maximum (0.72%) in Zinc sulphate 1% + Borax 1% (T_8). Acidity per cent was reduced with borax arid zinc sulphate treated fruits which might be due to early ripening induced by this treatment during which degradation of acid might have occurred. It also appears that total soluble solids increased at the expense of acidity under these fruits. The acid under the influence of borax and zinc sulphate might be fastly converted into sugars and their derivatives by the reaction involving the reversal of glycolytic pathway or be used in respiration or both. These results are also corroborated with the findings of the Rajput and Chand (1976) [7], Ali *et al.* (1993), Pal *et al.* (2008) [6] and Awasthi and Lal (2009) [1] in guava.

The Maximum ascorbic acid (174.50 mg/100g pulp) was recorded with foliar application of zinc sulphate 1% + borax 1% (T_8) followed by (173.83mg/ zinc sulphate 1% + borax 0.5% (T_7). The minimum ascorbic acid (154.73mg/100g pulp) was recorded under control (T_0). This was due to borax and zinc sulphate spraying which provide boron to the plants and the role of boron is to activate the synthesis of ascorbic acid (Jain *et al*., 1985). Similar results have also been reported by Rajput and Chand (1976) [7], Awasthi and Lal (2009) [1]; Nitin *et al*. (2012) in guava. 5.7 Sugar (%).

The maximum reducing sugar (3.63%), non reducing sugar (3.55%) and total sugars (7.18%) was recorded with foliar spray of zinc sulphate 1% + borax 1% (T_8) followed by zinc sulphate 1%+ borax 0.5% (T_7).While. it was minimum under control (T_0). These results are in conformity with the findings of Rajput and Chand (1976) [7], Nitin *et al.* (2012) in guava fruit.

Table 1: Effect of foliar application of micronutrients on Bio-chemical attributes of winter season guava (*Psidium guajava* L.) cv. Lalit

Treatments	Total soluble solids (^{0}Brix)	Acidity (%)	Ascorbic acid (mg/100g pulp)	Reducing Sugar (%)	Non reducing Sugar (%)	Total Sugars (%)
T_0(Control)	7.32	0.61	154.73	2.87	2.92	5.79
T_1 (Zinc sulphate 0.5 %)	8.48	0.63	160.13	3.25	3.07	6.33
T_2 (Zinc sulphate 1%)	9.92	0.51	167.25	3.36	3.16	6.61
T_3 (Borax 0.5%)	7.91	0.52	160.03	3.00	3.13	6.13
T_4 (Borax 1%)	8.58	0.53	160.41	2.90	3.15	6.04
T_5 (Zinc sulphate 0.5%+Borax0.5%)	9.15	0.58	164.28	3.28	3.17	6.46
T_6 (Zinc sulphate 0.5%+ Borax 1%)	10.04	0.56	163.66	3.30	2.92	6.22
T_7 (Zinc sulphate 1%+Borax 0.5%)	10.59	0.65	173.83	3.45	3.27	6.62
T_8 (Zinc sulphate 1%+ Borax 1%)	11.18	0.72	174.50	3.63	3.55	7.18
S.Em. +_	0.311	0.035	4.061	0.131	0.120	0.162
C.D.at 5%	0.939	0.107	12.280	0.395	0.040	0.490

Conclusion

The Bio-chemical attributes of fruits with respect to total soluble solids, acidity, ascorbic acid, reducing sugar, non-reducing sugar and total sugars were obtained maximum with the foliar spray of zinc sulphate 1% + borax 1% (T_8). Therefore, it may be concluded that foliar spray of zinc sulphate 1%+ borax 1% (T_8) can be recommended to the guava growers for obtaining better quality attributes of winter season guava fruits cv. Lalit.

References

1. Awasthi, Priya, Lal S. Effect of calcium, boron and zinc foliar sprays on the yield and quality of guava (*Psidium guajava* Pantnagar J Res. 2009; 7(2):223-225.
2. Banik BC, Sen SK, Bose TK. Effect of zinc, iron and boron in combination with urea on growth, flowering, fruiting and quality of mango cv. Fazli. Environ. Eco-B. C.K.V., Kalyani. 1997; 15(I):122-125.
3. El Sherif AA, Saeed WT, Nauman UF. Effect of foliar application of potassium and zinc on behaviour of montakhab E.L. Kanater guava true. Bull. Hort. Res. Ins. Gizd, 1997-1998.
4. Joon NS, Singh RR, Daulta BS. Effect of foliar sprays of zinc and urea on yield and physico-chemical composition of ber fruits cv. Gola Haryana J Hort. Sci. 1984; 13(3-4):110-112.
5. Kumar R, Tiwari JP, Lal S. Influence of zinc sulphate and boric acid spray on vegetative growth and yield of winter season guava (*Psidium guajava* L.) cv. Pant Prabhat. J Res. 2010; 8(1):135-138.
6. Pal, Anju, Pathak RK, Pal Krishna, Tejbir S. Effect of foliar application of nutrients on yield and quality of guava (*Psidium guajava* L.) fruits cv. Sardar. Prog. Res. 2008; 3(1):89-90.
7. Rajput CBS, Chand S. Effect of boron and zinc on the physico-chemical composition of guava fruit (*Psidium guajava* L.). I. National Agri. Soc. Ceylon. 1976; 13:49-53.
8. Singh R, Chaturvedi OP, Singh R. Effect of pre-harvest spray of zinc, boron and calcium on the physico-chemical quality of guava fruit (*Psidium guajava* L.). International Seminar on Recent Trend on Hi-Tech Hort. and P.H.T., Kanpur. 2004, 2004-204.
9. Yadav HC, Yadav AL, Yadav DK, Yadav PK. Effect of foliar application of micro-nutrients and GA_3 on fruit yield and quality of rainy season guava (*Psidium guajava* L.) cv. L-49. Plant Archives. 2011; 11(1):147-149.