Plant Archives Vol. 17 No. 2, 2017 pp. 1457-1459 *ISSN 0972-5210*

EFFECT OF FOLIAR APPLICATION OF MICRONUTRIENTS ON PHYSICAL PARAMETERS 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 eighteen year old guava trees, to study the Effect of foliar application of micronutrients on yield and quality of winter season guava (*Psidium guajava* L.) *cv.* Lalit.", revealed that fruit set ,fruit retention, fruit size (length and width), weight, volume, specific gravity, yield were maximized when foliar spray was done with 1% zinc sulphate and 1% borax**.**

Key words: Guava, Zinc, Borax, Physical Parameters, Yield.

Introduction

Guava (*Psidium guajava* L.) *cv.* Lalit is one of the most important tropical and sub-tropical fruit crops of India, which belongs to the family Myrtacae. 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 ph 8.5, It can with stand to the maximum temperature at 460C, 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. 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). The present investigation was, therefore, undertaken to study the effect of foliar application of micronutrients on physical parameters of winter season guava (*Psidium guajava* L.) *cv.* Lalit."

Materials and Methods

18-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-226025were taken for investigation. Zinc sulphate 0.5% ($\mathbf{T_1}$), Zinc sulphate1% ($\mathbf{T_2}$), Borax 0.5% ($\mathbf{T_3}$), Borax 1% ($\mathbf{T_4}$),Zinc sulphate 0.5% + Borax 0.5% ($\mathbf{T_5}$), Zinc sulphate 0.5%+ Borax 1% ($\mathbf{T_6}$), Zinc sulphate 1% + Borax 0.5% ($\mathbf{T_7}$) Zinc sulphate 1%+ Borax 1% ($\mathbf{T_8}$) along with Control ($\mathbf{T_0}$). 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. Observation were recorded for fruit set, fruit retention, fruit size (length and width), weight, volume, specific gravity and yield. The data so obtained were analysed statically.

Results and Discussion

A perusal of data in table.1 shows that significant response in fruit set maximum number of fruit set (65.43%) an maximum fruit retention (57.62%) was recorded with spray of Zinc sulphate 1% + Borax 1% (T_8) followed by (T_7) Zinc sulphate 1% + Borax 0.5% (62.07% & 52.99%) in comparison to control (46.08% & 38.47%). Borax response was more positive due to boron which plays an important role in translocation of carbohydrates auxin synthesis to the sink and increased in pollen viability and fertilization. Whereas Zinc Sulphate aids synthesis of plant growth substances and enzyme systems and is essential for promoting certain metabolic reactions. Similar results were also observed by Yadav *et al* (2011) and Awasthi and Lal (2009) in guava.

The maximum length (7.69cm), width (7.23cm), weight (134.63 g) and volume (120.16 ml) of fruit were recorded with zinc sulphate 1% + borax 1% (T_8) which was closely followed by lower concentration of zinc sulphate 1% + borax 0.5% (T_7). The minimum length, width, weight and volume of fruit were recorded under control (water spray, T_0). This increase in length and width of guava fruit may be due to the fact that mineral nutrients (Boron and zinc) appeared to have indirect role in hastening the process of cell division and cell elongation due to which size, weight and volume would have improved. Similar results have also been reported by Rajput and Chand (1976), Singh *et al*. (2004), and Pal *et al*. (2008) in guava. They reported that zinc sulphate + borax spray increased fruit weight, size (length and width) and volume of fruit in guava.

The fruit yield per plant was influenced by different treatments as compared to control. Significantly maximum yield (60.65 kg/tree) was recorded with zinc sulphate 1% + borax 1% (T_8) which was at followed with zinc sulphate 1% + borax 0.5% (T_7). This was due to fact, that borax and zinc sulphate spraying provides boron and zinc to the plant, and the role of boron in the formation of hormone is yet little under stood, it was believed that boron brings about inactivation of superfluous growth hormone by formation of complex compound. The importance of this element in improving the physiological activities of plant had been released but it is not clear whether it influenced directly or indirectly. These activities improve size (width, length) and weight of fruit which ultimately increased the yield of fruit, similarly zinc sulphate promots growth hormones, starch formation and seed maturation, weight of fruit. These results are in close conformity with the findings of Kumar *et al*. (2010), Awasthi and Lal (2009) in guava and Joon *et al*. (1984) in ber.

The data pertaining to specific gravity of guava as presented in table 1. Clearly indicated that the foliar application of growth regulators and nutrient significantly increased specific gravity of guava fruit over control (T_0). The critical observation of the data showed that maximum specific gravity (1.17) was found in treatment Zinc Sulphate 1.0% + Borax 1.0 % (T_8). Followed by (1.16) Zinc Sulphate 1.0% + Borax 0.5 % (T_7). The minimum specific gravity was noticed in control (T_0). The results are in close conformity with the findings of Banik *et al*. (1997).

Conclusion

The yield and physical parameters of fruits with respect fruit set, fruit retention, fruit length, fruit width, fruit weight, fruit volume and specific gravity were obtained maximum with the foliar spray of zinc sulphate 1% + borax 1%. Therefore, it may be concluded that

Table1: Effect of foliar application of micronutrients on physical parameters of winter season guava (*Psidium guajava* L) *cv.* Lalit.

Treatments	Fruit Set (%)	Fruit retention (%)	Fruit Length (cm)	Fruit Width (cm)	Fruit Weight (gm)	Fruit Volume (ml)	Yield (q/ha)	Specific gravity
T_0 (Control)	46.08	38.47	6.59	5.63	102.42	92.25	124.09	0.94
T_1 (Zinc sulphate 0.5 %)	57.90	48.34	7.20	6.07	112.25	105.72	138.91	1.04
T_2 (Zinc sulphate 1%)	55.06	52.40	7.40	6.57	122.40	108.22	153.12	1.04
T_3 (Borax 0.5%)	54.65	49.17	7.18	6.49	108.04	103.15	134.53	1.12
T_4 (Borax 1%)	50.36	48.91	6.65	6.33	118.55	113.00	144.31	1.05
T_5 (Zinc sulphate 0.5% +Borax0.5%)	58.54	49.82	6.65	6.35	120.20	110.00	149.27	1.05
T_6 (Zinc sulphate 0.5%+ Borax 1%)	60.93	50.08	7.27	6.76	114.47	108.43	142.06	1.14
T_7 (Zinc sulphate 1%+Borax 0.5%)	62.07	52.99	7.52	7.21	123.83	113.11	161.21	1.16
T_8 (Zinc sulphate 1%+ Borax 1%)	65.43	57.62	7.69	7.23	134.63	120.16	167.99	1.173
S.Em.±	2.197	1.867	0.203	0.146	4.406	3.059	7.821	0.024
C.D.at 5%	6.643	5.646	0.613	0.442	13.322	9.250	23.650	0.074

foliar spray of zinc sulphate 1%+ borax 1% can be recommended to the guava growers for obtaining better yield and improve physical parameters of winter season guava fruits.

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