International Journal of Farm Sciences **6(3):** 155-158, 2016

Short Communication

Economic feasibility of applying foliar nutrition in guava (*Psidium guajava* L) cv Sardar L-49

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ABSTRACT

A field experiment was carried out to study the response of guava (*Psidium guajava* L) cv Sardar L-49 to foliar application of micronutrients viz zinc, iron and boron in different combinations for economic feasibility. The results revealed that the application of zinc, iron and boron increased the net realization in guava. The treatment zinc sulphate (0.5%) + ferrous sulphate (0.5%) + borax (0.3%) gave maximum net realization of Rs193314. The foliar spray of Zn, Fe and B increased cost/ benefit ratio in guava. The same treatment resulted in highest cost/benefit ratio (1:4.39) as compared to other treatments and found to be most economical while lowest cost/benefit ratio (1:2.72) was found in treatment zinc sulphate (0.5%) alone.

Keywords: Zinc sulphate; ferrous sulphate; boron; guava; foliar application

INTRODUCTION

Guava (*Psidium guajavan* L) is one of the most common and important fruit crops cultivated all over India. It is fourth most important fruit crop in area and production after mango, banana and citrus (Pedapati and Tiwari 2014). It is commonly grown in wide range of soils and climatic conditions even with less attention. However deep and fragile loam is ideal soil for its better cultivation it being surface rooted. It thrives well in shallow clay or calcareous soil with pH values up to 8.2 and can also thrive on light soil with pH value as low as 4.5. Micronutrients like Fe, Zn, B, Cu, Mn, Mo and Cl play a vital role in plants. Micronutrients can be applied to plants by soil and foliar application however foliar application is more effective than soil application. The importance of micronutrients in achieving higher yield and better quality of fruit crops has been well recognized in recent times. Limited work has been done on the use of micronutrients for improving fruit size and quality of guava in India as well as in different parts of the world.

Sharma and Bhattacharyya (1994) obtained the highest number of leaves and total number of flowers when plants were treated with non-chelated and chelated zinc at the concentration of 0.4 per cent. The fruit retention (62.86%), fruit weight (153.89 g), highest number of fruits per plant (489.69) and yield of fruits (20984 kg/ha) were recorded in treatment 0.6 per cent $ZnSO_4$ (Jat and Kacha 2014). Trivedi et al (2012) reported that the combined foliar application of zinc sulphate (0.6%) and boric acid (0.5%) before fruit set resulted in higher yield, fruit weight, radial diameter, polar diameter, specific gravity, TSS, acidity, ascorbic acid, total sugar, non-reducing sugar and sugar/acid ratio in guava. Arora and Singh (1970) observed maximum increase in extension of terminal shoots, number of leaves, leaf area per shoot, chlorophyll recovery and yield under 0.4 per cent iron sulphate spray. Maximum increase in fruit weight, length and diameter was noted under 0.2 per cent. Maximum effect of acidity, non-reducing sugars and vit C was exhibited under 0.4 per cent while reducing sugars and TSS were affected with 0.2 per cent spray.

MATERIAL and METHODS

Field experiment was carried out at Fruit Research Station (Khengarvav), Department of Horticulture, Junagadh Agricultural University, Junagadh, during Kharif 2011-12. Four years old uniform guava plants spaced at 6 x 6 m were selected. The experimental findings were analyzed in randomized block design with eight treatments replicated thrice, two plants considered as a unit. The treatments consisted of T_1 (0.5% zinc sulphate), T_2 (0.5% ferrous sulphate), T_3 (0.3% borax), T_4 (0.5% zinc sulphate + 0.5% ferrous sulphate), T_5 (0.5% zinc sulphate + 0.3% borax), T_6 (0.5% ferrous sulphate + 0.3% borax), T_7 (0.5% zinc sulphate + 0.5% ferrous sulphate + 0.3% borax) and T_8 (control).

Required quantity of zinc sulphate, ferrous sulphate and borax were weighed and dissolved in a small quantity of solvent. Calcium hydroxide and citric acid were added in zinc sulphate and ferrous sulphate solution respectively to avoid scorching effect on the leaves. Spraying was done by knapsack sprayer. Both the upper and lower sides of the leaves were thoroughly sprayed with fine mist. Spraying was done on clear sunny days. The treatments were imposed at four different stages viz pre-bloom, full bloom, fruit set initiation and fruit development. The manures and fertilizers were applied in each treatment before flowering in first week of July. Well rottened farm yard manure was applied @ 25 kg per plant. Nitrogen was applied in the form of urea, phosphorus in the form of single super phosphate and potash in the form of muriate of potash. Nitrogen, phosphorus and potash were applied each @ 250 g per plant as a basal dose during July. Second dose of nitrogen @ 250 g per plant

was applied at full bloom stage during second week of October. Irrigation was given at 10 days interval or as per requirement throughout the season. Because of varying period of flowering the fruits did not mature and ripe at the same time therefore it required frequent hand picking. The fruits were harvested when their skin turned light yellow. Randomly selected branches in all directions of the trees from each treatment were tagged for the observations. The yield per hectare was calculated from which gross realization and net realization were estimated and ultimately cost/benefit ratio was calculated. The data were subjected to statistical analysis as per the method given by Panse and Sukhatme (1985).

RESULTS and DISCUSSION

The results revealed that the application of zinc, iron and boron increased the net realization in guava. The net realization was worked out from the yield of guava by taking into consideration the prevailing price of guava fruit and inputs used during the experimentation.The treatment T_7 (0.5% zinc sulphate + 0.5% ferrous sulphate + 0.3% borax) gave maximum net realization of Rs193314. The data regarding cost/benefit ratio value were calculated from gross realization and total expenditure incurred and indicated that foliar spray of Zn, Fe and B increased cost/ benefit ratio in guava. The treatment T_7 (0.5% zinc sulphate + 0.5% ferrous sulphate + 0.3% borax) gave highest (1:4.39) cost/benefit ratio as compared to other treatments and was found to be most economical while lowest cost/benefit ratio (1:2.72) was found in T_1 (0.5% zinc sulphate).

Table 1. Effect of zinc, iron and boron on net realization and cost/benefit ratio in guava

Treatment	Yield (kg/ha)	Gross realization (Rs/ha)	Total cost of cultivation (Rs/ha)	Net realization (Rs/ha)	C:B ratio
T_1	11883	178245	43789	134456	1:3.07
T_2	14598	218970	43763	175207	1:4.00
T_3	12797	191955	43733	148222	1:3.38
T_4	11773	176595	43880	132715	1:3.02
T_5	12465	186975	43850	143125	1:3.26
T_6	11634	174510	43824	130686	1:2.98
T_7	15817	237255	43941	193314	1:4.39
T_8	10831	162465	43672	118793	1:2.72

Cost of guava= Rs 15/kg

T_1 (0.5% zinc sulphate), T_2 (0.5% ferrous sulphate), T_3 (0.3% borax), T_4 (0.5% zinc sulphate + 0.5% ferrous sulphate), T_5 (0.5% zinc sulphate + 0.3% borax), T_6 (0.5% ferrous sulphate + 0.3% borax), T_7 (0.5% zinc sulphate + 0.5% ferrous sulphate + 0.3% borax) and T_8 (control)

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Received: 8.6.2015 ***Accepted: 15.10.2015***