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Effect of foliar application of micronutrients and plant growth regulators on yield and physical characteristics of guava (*Psidium guajava* L.) cv. Allahabad Safeda

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Abstract

A field experiment was conducted during 2016 at Horticulture Research Farm-1, BBAU, Lucknow on 18-year-old guava plants, to studies the Effect of foliar application of micronutrients and plant growth regulators on yield and physical characteristics of guava (*Psidium guajava* L.) cv. "Allahabad Safeda" from the present study it can be concluded that the Borax@0.4%+GA₃@50ppm followed by Borax @0.4% significantly increased the fruit set, fruit retention, fruit size, fruit length, fruit width, fruit yield, volume and specific gravity.

Keywords: ZnSO₄, Borax, NAA, GA₃, guava, physical characters

Introduction

Guava (*Psidium guajava* L.) belongs to family Myrtaceae is one of the important tropical and sub-tropical fruit of India. It is also known as "apple of tropics". It has been in cultivation in India since 17th century and has originated in tropical America perhaps from Mexico to Peru and introduced in India by Portuguese. The major guava producing countries are South Asian countries of the world. Hawaiian Islands, Cuba and India. It is now cultivated in more than 60 countries of the world, it is commercially cultivated in India, Brazil, Mexico, Florida, Hawaii, California Peru, Egypt, Algeria, Columbia, West Indies, China and Malaysia. The total cultivated area of guava in India is 254 thousand hectares with an annual production of 4046 thousand MT (NHB2015-16). Guava fruit is considered as one of the delicious and luscious fruit. Guava contains 82.5% water, 2.45% acid, 4.45% reducing sugar, 5.23%, Non-reducing sugar, 9.73% TSS and 260 mg vitamin C/100g fruits which differ with the cultivar stage of maturity and season. It is also good source of pectin (0.78%). The growth regulators and micronutrients play a vital role in growth and development of fruit trees and very effective in manipulating cropping season, improving fruit set, fruit retention and quality of guava fruits.

Material and Methods

18-year-old guava plants were taken for the investigation Effect of foliar application of micro nutrients and plant growth regulators on yield and quality. First spraying of micro nutrients and plant growth regulators were done before flowering (first week of August) and second after fruit set (second week of September) during 2016-17. Thus there were total nine treatment including (to water spray), T₁ ZnSO₄ @ 0.4%, T₂ Borax @ 0.4%, T₃ NAA @ 50 ppm, T₄GA₃@ 50ppm, T₅ ZnSO₄ @ 0.4% + NAA @ 50ppm, T₆Borax @ 0.4% + NAA @ 50 ppm, T₇ ZnSO₄ @ 0.4% + GA₃ @ 50ppm, T₈Borax @ 0.4%+ GA₃ @ 50 ppm. The experiments was laid out in Randomized Block Design and replicated thrice taking a single tree as an unit. At harvest, a representative. Sample of twenty-three greenish yellow color mature fruits were taken randomly from three trees of each treatment and the observations on various physical attributes were recorded.

Result and Discussion

In the present investigation, the results revealed that all the treatment of Borax@0.4%+GA₃@50ppm followed by Borax @0.4% significantly increased (Table 1), The fruit set, fruit retention, fruit size, fruit length, fruit width, fruit yield, volume and specific gravity. These results are quite similar to the finding of Gerstein (1973) reported foliar application of GA₃ 5 times at weekly interval increased fruit yield in orange, Kundu and Mitra (1999) [5] reported that foliar application of borax (0.1%) increased fruit yield in guava, Ingle

(1993) [4] found that foliar application of borax (0.2%) increased fruit yield in guava cv. L-49. Chaitanya *et al.* (1997) [3] observed that foliar spray of borax (0.4%) improved fruit yield in guava cv. L-49, Banik *et al.* (1997) [3] found that foliar application borax 0.4% significantly increased length, width and weight in mango cv. Fazli, Chaitanya *et al.* (1997) [3] observed that borax increased length, diameter and weight of guava fruit cv. Sardar and similar results were also observed by Singh and Brahmachari (1999) in guava cv.

Allahabad Safeda, Ruby Rani and Brahmachari (2004) [7] reported that foliar application of GA₃ (100-200 ppm) increased size and weight of fruit in mango cv. Amrapali. Kumar *et al.* (2004) [6] advocated that foliar application of borax (0.4 and 0.6%) significantly improve fruit length, diameter and fruit weight in litchi cv. Dehradun and Singh *et al.* (2004) [6] found that foliar spray of boric acid (0.4%) considerably increased size and weight of guava fruit in comparison to control.

Table 1: Effect of foliar application of micronutrients and plant growth regulators on yield and physical characteristics of guava (*Psidium guajava* L.) cv. "Allahabad Safeda".

Treatments	Fruitset (%)	Fruit retention (%)	Fruit yield/plant (kg/ha)	Fruit yield/ha(q/h)	Fruit length (cm)	Fruit width (cm)	Fruit weight (g)	Fruit volume (ml)	Fruit specific gravity
T ₀ Control (water spray)	49.38	39.78	43.81	118.63	6.65	5.89	108.59	101.56	1.06
T ₁ (ZnSO ₄ @ 0.4%)	57.34	47.27	56.85	158.03	6.92	6.37	130.67	118.56	1.10
T ₂ (Borax @ 0.4%)	61.24	52.03	62.06	167.98	7.52	6.90	141.10	126.77	1.11
T ₃ (NAA @ 50 ppm)	54.09	48.63	47.33	131.58	7.18	6.67	126.02	116.69	1.09
T ₄ (GA ₃ @ 50ppm)	51.20	48.86	48.93	135.75	6.90	6.40	135.81	123.26	1.10
T ₅ (ZnSO ₄ @ 0.4% + NAA @ 50ppm)	59.85	49.76	55.48	154.23	6.97	6.54	136.96	125.37	1.08
T ₆ (Borax @ 0.4% + NAA @ 50 ppm)	56.02	50.64	49.85	135.71	7.40	6.74	131.91	122.86	1.07
T ₇ (ZnSO ₄ @ 0.4% + GA ₃ @ 50ppm)	61.10	52.95	59.52	165.46	7.27	6.78	138.81	124.21	1.11
T ₈ (Borax @ 0.4%+ GA ₃ @ 50 ppm)	64.41	55.31	65.48	181.89	7.69	6.93	151.43	136.18	1.11
S.Em+	2.618	2.057	1.959	5.139	0.207	0.156	5.708	3.044	0.046
CD at 5%	7.916	6.219	5.922	15.538	0.625	0.470	17.260	9.205	0.050

Summary

The present investigation entitled Effect of foliar application of micronutrients and plant growth regulator on yield of 18-year-old guava cv. Allahabad Safeda. First spraying of micro nutrients and plant growth regulators were done before flowering (First week of August) and second after fruit set (second week of September) during 2016-17. All the treatments exerted significant effect on the fruit set, retention, size, length, width, weight, volume and specific gravity of guava fruit. The better-quality fruits of guava obtained with the foliar application of Borax@0.4%+GA₃@50ppm followed by 0.4 percent borax respectively.

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