ASIAN JOURNAL
ISSN: 0976-3376

Available Online at http://www.journalajst.com

ASIAN JOURNAL OF SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 4, Issue 06, pp.027-030, June, 2013

RESEARCH ARTICLE

EFFECT OF FOLIAR APPLICATION OF PLANT GROWTH REGULATORS AND NUTRIENTS ON YIELD AND QUALITY OF GUAVA (*Psidium guajava* L.) cv. LUCKNOW-49

Thirumal Raj, S. and *Rajkumar, M.

Assistant Professor, Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar – 608 002, Tamilnadu, India

ARTICLE INFO

Article History:
Received 15th February, 2013
Received in revised form
27th March, 2013
Accepted 08th May, 2013
Published online 30th June, 2013

Key words:
Single Fruit weight, Number of Fruits Per Plant.

ABSTRACT

An experiment was conducted to find out the "Effect of foliar application of plant growth regulators and Nutrients on yield and quality of guava (*Psidiumguajava* L.). cv. Lucknow-49". The plant growth regulators Naphthalene Acetic Acid @ 100, 200 and 300 ppm and Ethrel @ 1000, 1200 and 1800 ppm were given as foliar application of Nutrients like Potassium Iodide @ 1.0%, 1.5% and 2.0% different concentration of urea @ 1.0%, 1.5% and 2.0% concentration. Foliar application of urea @ 1.5% showed the best result in single fruit weight, number of fruits per plant and yield per plant, high TSS, high total sugar, high ascorbic acid and low acidity content. Foliar spray of Potassium Iodide recorded the highest flower drop and lowest yield. The foliar application of urea @ 1.5 percent showed maximum yield of (34.56 kg/tree) and has good quality characters followed by NAA @ 200 ppm (33.28 kg/tree).

INTRODUCTION

Guava (*Psidium guajava* L.), belongs to the family Myrtaceae. It is called as "apple of the tropics", and grown successfully throughout tropical and sub-tropical climatic regions of India. Guava is one of the richest natural sources of vitamin C containing two to five times more than oranges and ten times more than tomato. It is rich sources of calcium, phosphorous and iron which are necessary for human health. Guava is rich sources of vitamin C and pectin. Guava fruit contains 82.5% water, 2.45% acids, 4.45% reducing sugars, 5.23% non-reducing sugars, has 9.73% TSS, 0.48% ash and 260 mg vitamin C/100g fruit (which differ with cultivar, stage of maturity and season). Guava fruit is relished when mature or ripe, or, when freshly plucked from the tree. It is also used in making many commercial products like jelly, fruit butter, juice, etc. (Dinesh and Vasugi 2010). Guava is also attractive fruit in appearance, shape, fragrance and nutrition. Depending on cultivars, it contains four times more ascorbic acid than orange (over 200 mg 100-1g) and generally a broad low-calorie profile of essential nutrients (Adrees *et al.*, 2010; Hassimotto *et al.*, 2005). The seeds also contain omega-3 and omega-6 polyunsaturated fatty acids and especially high levels of dietary fiber (Anon., 2009). Due to their astringent properties, mature guava fruits, leaves, roots and bark are used in local medicines to treat gastroenteritis, asthma, high blood pressure, obesity and diarrhea (Joseph & Priya, 2011).

Corresponding author: Rajkumar, M.
Assistant Professor, Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar – 608 002, Tamilnadu, India.

MATERIALS AND METHODS

The present study on the effect of foliar application of plant growth regulators and nutrients on yield of guava (*Psidium guajava* L.) was conducted at the orchard, Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar during the year 2011-2013. The geographical position of the place is situated at 11° 24' North latitude and 79° 44' East longitude and altitude of +5.79m Mean Sea Level. The field and laboratory investigation of guava was carried out over a period of one calendar year from February 2012 to February 2013.The trees of guava variety Lucknow-49, aged about 15 years, were used for the study. It is an evergreen tree, reaching to a height of 13 feet. Analytical grade Potassium Iodide, Ethrel, Naphthalene Acetic Acid and Urea were used in the study. Single foliar sprays were given to trees arranged in Randomized Block Design with three replications. The spraying was done during three different stages *viz.,* bud stage (first stage), pea stage (second stage) and fruit stage (third stage).Guava trees flower during two season's*viz.,* January – March and September-October.The fruits mature during the month of April – May and November – January. The ripened fruits of these trees were collected individually.The Growth regulators and Nutrients were diluted with the required amount of water for foliar application.

RESULTS AND DISCUSSION

Fruit set percentage in guava: All the treatments exhibited wide variations for fruit set percentage which ranged from (78.7) percent to (97.9) percent.

Effect of plant growth regulators and nutrients on fruit set (%) No. of fruits/plant Fruit yield/ plant in guava cv. Lucknow-49

Treatment	Fruit set (%)	No. of fruits /plant	Fruit yield/plant
T_1- KI – 1.0%	88.3 (69.9)	180.42	24.82
T_2 –KI – 1.5%	85.1 (67.29)	176.37	24.41
T_3 –KI – 2.0%	83.5 (66.03)	172.42	22.85
T_4 - Ethrel – 1000 ppm	80.3 (63.65)	188.34	29.08
T_5 - Ethrel – 1400 ppm	81.9 (64.82)	202.24	31.62
T_6 - Ethrel – 1800 ppm	86.7 (68.61)	184.31	26.11
T_7 - NAA – 100 ppm	89.9 (71.46)	198.28	30.36
T_8 - NAA – 200 ppm	94.7 (76.69)	208.17	33.28
T_9 - NAA – 300 ppm	91.5 (73.04)	192.37	27.81
T_{10} - Urea – 1.0 %	96.3 (78.90)	194.29	26.52
T_{11} - Urea – 1.5 %	97.9 (81 –66)	212.15	34.56
T_{12} - Urea – 2.0 %	93.1 (74.77)	204.13	32.02
T_{13} – Control	78.7 (62.51)	163.72	19.45
CD	1.52	3.94	1.25
SE.D	0.75	1.96	0.62

The difference between the treatments was found to be significant (Table 1). The performance (T_{11}) was found to be the best with a value of (97.9) per cent which was followed by the treatments (T_{10}) (96.3) percent and (T_{12})(93.1) percent the treatment (T_{13}) has exhibited the least performance with a value of (78.7) per cent

Number of fruits per plant in guava

The observed treatments exhibited wide variation for number of fruits per plant which ranged from (163.92 to 212.15). The difference between the treatments was found to be significant. The performance of (T_{11}) was found to be the best with 212.15 number of fruits per plant which was followed by the treatment T_8 (208.17) and (T_{12}) (204.18).The treatment ($T1_3$) had exhibited the least performance with a value of 163.92.

Fruit yield per plant in guava

The fruit yield varied from (19.45 to 34.56 kg) at harvest among all the treatments and a significant difference was observed among all the treatments. The values for this traits as the highest (34.56 kg) in the treatment (T_{11}). This was followed by the treatments (T_8) (33.28 kg) and (T_{12}) (32.02 kg). The value for these traits was the lowest (19.45 kg) in the treatment (T_{13}).

DISCUSSION

Highest fruit set was observed in treated with treatment urea @ (1.0% and 1.5%) whereas lowest percentage was observed in control. It is noteworthy that urea sprays resulted in improved fruit set .This may be attributed to the improved nitrogen status of the plants thereby increasing fruit set. This was in line with the findings of (Dhalwal *et al.,* 2002), in guava and Subhadrabandhu *et al.,* (1999) and Albuquerque *et al.,*(2000) in mango. In general fruit weight and fruit size was improved by all the treatments.The maximum fruit diameter, fruit length and number of fruit per plant was registered in T_{11} (urea @ 1.5%) and T_8 (NAA @ 200 ppm). The increase in size of fruit as result of foliar application of urea and NAA in present investigation might be due to the salt portioning of assimilates make forwards the fruit development which is strong sink (Anbu *et al.,* 2001).The present study was in line with the observation of Dhaliwal *et al*., (2002) and Yadav *et al.,* (2001) in guava, NavPrem Singh *et al*. (2005) and Khamis *et al*. (2004) in mango.

Increase in size of the fruit as a result of foliar application of NAA in present investigation might be due to the fact it had improved the internal physiology of developing fruit in term of better supply of water nutrients and other compounds vital for their proper growth and development which resulted in improved size and ultimately greater yield as compared to control (Pandey (1999). The single fruit weight (g) and fruit yield (kg) was higher in treatment (T_{11}) urea @15% and followed by (T_{10}) urea @10% and T_7 NAA @ 100 ppm foliar application of potassium Iodide resulted in maximum reduction in the yield. Earlier researches provide that foliar application of urea increase the yield and sizes of the fruits. Following application of urea is transformed into amino acids specially arginine and polyamines (Vijayakajshmi and Srinivasan, 1999). Polyamines are involved in many plants developmental process, including cell division, embryogenesis reproductive organs development floral initiation .The foliar application of urea @1.5percent increased the yield in Guava.

REFERENCES

Adrees, M., M. Younis, M. Farooq and K. Hussain. 2010. Nutritional quality evaluation of different guava varieties. *Pak. J. Agri. Sci.,* 47: 1-4.

Albuquerque, J. A. S. De., M. A. Monco and Do., C. 2000. Mango flowering induction circular tecnica da Embrapa Semi- Arido., 47 pp: 34.

Anon. 2002. Economic survey 2002-2003. Ministry of Finance and Company Affairs. Economics Division. Governmnent of India. 162 p.

Anbu, S., S. Parthiban, J. Rajanagam and T. Thangaraj. 2001. Induction of off season flowering in mango (*Mangiferaindica* L.) using paclobutrazol. South Indian Hort. 49: 75-78.

Dinesh. M. R and C. Vasugi. 2010. Guava improvement in India and future needs. *J. Hortl. Sci.* Vol. 5 (2): 94-108.

Dhaliwal, G.S., N. K. Nanra, and H. S. Rattanpal. 2002. Effect of chemicals on flower drop, fruit set and yield on rainy and winter season crops of guava. *Indian J. Hort*., 59 (1):31-33.

Gorakh Singh; A.K.Singh, Shailendra Rajan and S. R Bhriguvanshi. 2002. Strategy for crop regulation in guava (*Psidium guajava L.*) through foliar urea sprays and its effect on different N-forms in leaves. *Journal of Applied Horticulture*. 4(2): 93-98

Hassimotto, N.M., M.I. Genovase and F.M. Lajolo. 2005. Antioxidant activity of dietary fruits, vegetables, and

commercial frozen fruit pulps. *J. Agri. Food Chem*., 53: 2928-2935.

Jimenez-Escrig, A., M. Rincon, R. Pulido and F. Saura-Calixto. 2001. Guava fruit (*Psidium guajava* L.) as a new source of antioxidant dietary fiber. *J. Agri. Food Chem.,* 49: 5489-5493.

Joseph, B. and M. Priya. 2011. Review on nutritional, medicinal and pharmacological properties of guava (*Psidiumguajava* linn.). *Int. J. Pharma Bio Sci*. 2: 53-69.

Khamis, M.A.; KH. A. Bakry and S. A. Abd El- Moty. 2004. Improving Growth And Productivity Of Guava Trees According to the yearly Bull. Agric. Economic and Statistics Ministry of Agriculture and Land Reclamation of Egypt.

Nav Prem Singh, C.S. Malhi and R.C. Sharma 2005. Effect of foliar feeding of N. P and K on vegetative and fruiting characters of Mango cv. Dusehri. International conference on mango and date palm: culture and Export.20th to 23rd June, 2005.

Pandey, V. 1999. Effect of NAA and GA spray on fruit retention, growth yield and quality of ber (*ZizyphusManuritiana* Lamk.) cv. Banarasi and 'Karaka'. Orissa J. Hort 27: 69-73.

Subhadrabandhu, S., K. Lamsub and L. Katoka. 1999. Effect of paclobutrazol application on growth of mango tree and detection of desidues in leaves and soil. *Japanese. J. of Trop. Agri.* 43 (4): 249-253.

Vijayakajshmi, D and P. S. Srinivasan.1999. Enzyme activities as influenced by chemicals and growth regulators in Mango cv. Alphonso. *Madras Agric. J.,* 86 (10-12): 578-580.

Yadav, S. J., S. K. Bhatia, R. K. Godara and G. S. Rana, 2001. Effect of growth regulators on the yield and quality of winter season guava cv. L-49. *Haryana J. Hort. Sci.*, 30: 1-2.

****