



## Crop Regulation In Guava (*Psidium Guajava* L) A Review

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### ABSTRACT

Guava is highly prolific and remunerative fruit which grows well under wide range of soil and agro climatic conditions. The fruit is nutritious being rich in vitamin C (200-300 mg/100g of pulp). It also contains a fair source of vitamin A, riboflavin, thiamine and minerals like calcium, phosphorus and iron. In the absence of dwarfing rootstocks for guava, techniques that restrict the vegetative growth are important in management of tree canopy. As guava tree respond well to canopy modification with respect to vegetative and reproductive growth therefore, modification of canopy through pruning and use of certain growth retardant along with increasing the plant density may be steps to enhance the production efficiency.

### KEYWORDS

### INTRODUCTION

Guava (*Psidium guajava* L) is very important tropical fruit crop grown throughout the tropical and sub-tropical areas and belongs to the family of myrtaceae, commonly known as the apple of tropics. It is a hardy, prolific bearer and highly remunerative fruit crop and also can be grown satisfactorily even in adverse soil and climatic conditions. It is one of the most important fruit in terms of area and production after mango, banana and citrus. The area and production of guava is increasing worldwide, but there is no significant increase in productivity. Presently, the productivity of guava is smaller than productive potential primarily due to traditional system of wider planting and secondarily due to poor canopy management practices. The basic principle of crop regulation is to manipulate the natural flowering and fruiting of guava plant in desired season of the year that contribute to increased fruit yield, quality, profitability and sustainability of the environment by reducing the use of the frequency of the pesticides. (Mahadevan and Kumar, 2014) The crop regulation can be achieved by the adoption of the various practices like training and pruning and growth retardant.

### CANOPY REGULATION THROUGH TRAINING AND PRUNING

Open centre systems or delayed open centre is generally recommended. Pruning consists of removal of suckers arising from the base of the trunk. Dried twigs and branches have to be removed and the cut ends may be applied with Bordeaux paste. The flowers are borne on the axils of current season shoots. Light annual pruning after harvesting promotes vegetative growth and flowering. In Tamil Nadu, it is recommended that the tips of 10-12 cm lengths of past seasons shoots are pruned during September and February every year to encourage more laterals. Pruned trees give large fruits and early ripening. When the trees become old, the branches are pollarded leaving 30 cm in length at their origin. The cut branches produce plenty of shoots and flowers and ultimately high yields. In the trees having upright and tall growth habits, the straight growing branches are bent and tied on the pegs driven on the ground. In the bent branches, dormant buds are activated and induced to produce flowers and fruits heavily.

In certain parts of Maharashtra, root pruning is practiced to produce heavy yield. In this method roots are exposed and minute roots are cut away and irrigation is withheld so as to allow the leaves to shed. Then, the basins are covered with the manures and soil and irrigated copiously. (Kumar, 2010)

The pruning may be helpful in reducing the tree size and improving the fruit quality as well Haropinder and Bal (2006). Lal (1983) indicated that the yield of guava cv. Sadar was improved by pruning. Pruning and hydrogen Cyanamid were found to modify the production curve of guava Quijada et al. (1999). Also, Salah (2005) produced the highest bud emergence of guava by using severe and moderate pruning. Haropinder and Bal (2006) stated that pruning with (10 and 20 cm) and growth regulators (paclobutrazol and ethephon at 500 and 1000 ppm) treatments on guava cv. Allahabad Safeda trees during rainy season planted with four different spacing's (6 x 2 m, 6 x 3 m, 6 x 4 m and 6 x 5 m). Maximum fruit size, palatability rating, TSS and vitamin C were noted in wider spacing (6 x 5 m). They found that maximum Vitamin C was found in control in guava fruits. Physical characters like fruit weight was improved at 20 cm level of pruning. Whereas, fruit quality (chemical characters) were noted better at 10 cm level of pruning. The time and intensity of pruning affected guava cv. Paluma tree sprout and yield (Serrano et al. 2008a). Moreover, (Serrano et al. 2008b) reported that the light pruning increased the number of productive branches and number of fruits per branch of Guava cv. paluma.

### CANOPY REGULATION THROUGH GROWTH RETARDANT

Paclobutrazol (PBZ), a non-polar broad spectrum growth regulator, has been characterized as an environmentally stable compound in soil and water environments with a long half-life under both aerobic and anaerobic conditions. Moreover PBZ is unlikely to volatilize to any significant extent owing to a low estimated vapour pressure. Paclobutrazol is translocated acropetally via xylem in plants (Hamid and Williams 1997, Wang et al. 1986), although phloem translocation has also been reported (Witchard 1997). In India PBZ has been registered as a plant growth regulator under the section 9(3) of Insecticides Act, 1968 in November 2009 by Central Insecticides Board &

Registration Committee (Kegley *et al.* 2010) and is available in the market with various trade names.

Paclobutrazol helps in making the plants dwarf by producing a retarding effect on the growth of tree through inhibition of gibberellin biosynthesis, a key plant growth promoter. Similarly, ethephon acts as a ripening hormone and it enhances the ripening process along with its growth retardation effect. Ethephon at higher concentrations (500-3000 ppm) proved to be quite effective in reducing the plant height (Mohammed *et al.*, 1984). Singh (2006) and Singh and Bal (2006) also investigated the positive effect of PBZ application in restriction of vegetative growth of guava plants.

## REFERENCE

1. Hamid M M and Williams R R. 1997. Translocation of paclobutrazol and giberellic acid in Sturt's desert pea (*Swainsonia formosa*). *Plant Growth Regulation* 23:167-71.
2. Haropinder Jit Singh and J. S. Bal (2006). Effect of pruning and growth regulators on physio-chemical characters of guava during rainy season planted at different spacing. *Internat. J. agric. Sci. Vol. 2 No.2: (533-537)*.
3. Jaswinder Singh, B.2010. Influence of Paclobutrazol and Ethephon on Vegetative Growth of Guava (*Psidium guajava* L.) Plants at Different Spacing. *Not Sci Biol* 2 (3) 2010, 110-113.
4. Kegley S E, Hill B R, Orme S and Choi A H. 2010. PAN Pesticide Database. Pesticide Action Network, North America, San Francisco.
5. Kumar, N. 2010. Introduction to horticulture. Oxford & IBH publishing co. pvt. Ltd, New Delhi
6. Lal, S.(1983). Effect of pruning on crop regulation in guava (*Psidium guajava* L.) cv. Lucknow-49. *Prog. Hort.*, 7(3): 60-62
7. Mahadevan and Kumar, 2014. Effect of Crop Regulation and Fertigation on Vegetative Growth of Guava (*Psidium guajava*) cv. Sardar. *Trends in Biosciences* 7 (15), 2014
8. Mohammed, S., L. A. Wilson and N. Prendergast (1984). Guava meadow orchard: Effect of ultra high density planting and growth regulator on growth, flowering and fruiting. *Trop. Agric.* 61:297-301.
9. Quijada, O; F. Araujo and P. Corzo (1999). Effect of pruning and hydrogen cyanamide on bud break, flowering, fruit yield and quality of guava (*Psidium guajava* L.) in the municipality of Mara, state of Zulia. *Revista de la Facultad de Agronomia, Universidad del Zulia.*, 16(3): 276-291.
10. Salah, A. El-D.M.(2005). Effect of pruning on growth, flowering and fruiting of some guava cultivars. M.Sc. Thesis, Fac. Agric. Cairo Univ.
11. Serrano, L.A.L; C.S. Marinho; E. Gabetto, M. Silva and F.D.Tardin (2008a). Phenological and yield characteristics of "Paluma" guava tree pruned in different times and intensities, in north of Rio de Janeiro State, Brazil. *Revista Ceres*, 55(5): 416-424.
12. Serrano, L.A.L; M.V.V. Martins; I. De M. Lima; C.S. Marinho and F.D. Tardin (2008b). Effect of pruning time and intensity on Paluma' guava trees, in Pinheiros, ES, Brazil. *Revista Brasileira de Fruticultura*, 30(4): 994-1000.
13. Singh, H. J. and J. S. Bal (2006). Effect of pruning and growth regulators on physico- chemical characters of guava during rainy season planted at different spacing. *Int. J. Agric. Sci.* 2(2):533-537.
14. Singh, R. (2006). High density planting studies in Sardar guava (*Psidium guajava* L.) M.Sc Thesis, PAU, Ludhiana.
15. Wang S Y, Sun T and Faust M. 1986. Translocation of paclobutrazol, a gibberellin biosynthesis inhibitor, in apple seedlings. *Plant Physiology* 82: 11-4.
16. Witchard M. 1997. Paclobutrazol is phloem mobile in castor oil plant (*Ricinus communis* L.). *Journal of Plant Growth Regulation* 16: 215-7.