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# Canopy Management in Sapota (Achras Sapota L.)

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**ABSTRACT**

*Sapota is one of the important evergreen fruit crops grown in tropical regions of the world. Canopy management alters the tree stature, paving the way for better sunlight penetration and facilitates easy intercultural operation and harvest. Canopy management is a critical component to improve crop performance by increasing the magnitude of partitioning of dry matter towards reproductive parts. Management of canopy architecture deals with positioning and maintenance of plant's frame work in relation to optimum productivity of quality fruits. In modern fruit production, a tree, which has not received proper canopy management, becomes inefficient with low productivity. Once the tree gets occupied their allotted spaces crowding may occur and canopies of adjacent trees begin to overlap. The horticultural methods commonly known to control tree growth are training and pruning, dwarf varieties and growth retardants, which have a close bearing on canopy management.*

**KEYWORDS : canopy management, training & pruning, growth retardant**

## INTRODUCTION

Sapota is a native of tropical America more specifically Southern Mexico or Central America. It is an evergreen fruit tree known for producing fruits of delicate flavour, melting pulp with sweet taste (Chada, 1992). It belongs to the family Sapotaceae. It produces crop continuously in warm and moist tropical climate. It is hardy, highly productive and generally free from major pests, diseases and physiological disorders. Sapota being an evergreen tree, the growth and development is a continuous process. In general, the lateral branches of the well - grown sapota tree is in tiers. If left untrained or unpruned, the tree produces a dense canopy at the top resulting in poor productivity at the middle and bottom tiers due to poor sunlight penetration. After certain years of establishment, harvesting becomes cumbersome as the person who engaged in harvesting can have easy access with branches arising upto third or fourth tier only. Beyond that the harvester has to use a special device to harvest the fruits from those branches arising above third or fourth tier. One of the way to avoiding this problem is resorting to proper canopy management, which involves an early training and judicious pruning techniques.

The removal of those leader shoots arising above third or fourth tier *i.e.,* beheading of the growing point at or above the third or fourth tier may help to solve the harvesting problem. In general providing proper architecture to the tree from initial stages and mild pruning of side branches are essential for better management of sunlight penetration and aeration of the canopy. The regulation of canopy is to promote more fruiting branches and more penetration of sunlight to the inner parts of the canopy, which encourage larger bearing area with quality fruits. As the bearing habit of sapota is such that the flowers are borne on the terminals of shoots, pruning is reluctantly advocated in this crop.

## CANOPY MANAGEMENT THROUGH GENETICALLY DWARF CULTIVARS

| S. No | Genetically dwarf cultivars | Desirable features |
|---|---|---|
| 1 | PKM 1 | Tree is dwarf in stature |
| 2 | PKM 3 | Tree has a vertical growth habit |
| 3 | Co-3 | Trees grow upright with compact canopy |

## CANOPY MANAGEMENT THROUGH TRAINING AND PRUNING

Sapota grows with a central leader branching in tiers, as the trees grow continuously. In large trees, the top growth often results in shading of lower branches and by resisting wind penetration are susceptible to mechanical damages and the productivity is low. Training also helps to maintain the tree height, which facilitates hand picking of most of the fruits. Judicious pruning of branches check excessive vegetative growth and reduces the apical dominance of the terminal ends. Pruning also facilitates light penetration and aeration into canopy that influences the physiological processes directly or indirectly to regulate yield and improve fruit quality.

Sapota being an evergreen tree requires no regular pruning but regulation of vegetative growth to improve productivity and quality of fruits (Singh, 2010). A Seedling tree grows excellently giving a shape of an umbrella shape. However Plants raised through inarching require training for appropriate shape and good frame work development. No definite system of training has been developed for sapota. Most of trees are trained to central leader system. During Initial year, plants are topped to 60-70 cm above ground level. After emergence of new shoots below the cut point, 3-4 well spaced scaffold limbs are selected and allowed to grow to make strong frame work. At present pruning in sapota is confined to open the tree to light, and remove dead and diseased branches. Regular pruning of branches is not done in sapota as flowers and fruits appear in terminal leaf axils of past season wood.

All the growths that appear on the rootstock below the graft or bud joint must be removed. After 3-4 years from planting, the lower most branches up to a height of 60-90 cm may weigh down to ground and become unfruitful. Similarly, over shaded and crowded branches are also removed periodically to permit adequate sunlight and air circulation. Recently, it has been established that centre opening of the grown up trees above 3-4 tiers of scaffold branches is beneficial to get higher yield with quality fruits. Similarly, pruning of side branches by retaining ½ to 2/3 length encourages new growth, flowering and yield (Kumar, 2010).

Mathew (2007) studied that effect of canopy management under different planting densities in sapota cv. PKM 1 and reported that mild pruning for centre opening of sapota trees had resulted in lesser height increment compared to unpruned trees. However, higher production of lateral branches resulted in increased fruit yield, though there was reduction in the height increment. In general, pruned plants perform well both under wider spacing and narrow spacing in terms of yield and quality traits. Since, yield maximization is the prime objectives, the plants under narrow spacing with pruning were found to be the best.

Murugeswari (2007) reported that highest number of fruits and fruit yield per tree were observed in the training with three tiers and pruning moderately, which had recorded the highest number of flowers per cluster and fruit set percentage also. Compared to control, pruned trees recorded higher yield and good quality fruits. Moreover height control is achieved and ill effects to plants were not observed even in

trees that were trained to 3 tiers and pruned severely. Besids training and pruning facilitates easy hand picking of fruits and easier intercultural practices. Hence training to three tier and moderate pruning could form a recommendation for sapota growers.

Pradeepha (2004) recorded the highest tree height in control and the lowest tree height with medium pruning in sapota cv. PKM 1. Sathiya (2005) observed that the sapota 'PKM (Sa) 4' increment in tree height was highest in control trees against pruning treatments and the mean fruit weight, length, breadth and girth of the fruits were significantly higher in severely pruned trees. Acidity level and ascorbic content was also found to be influenced by canopy management. Sathiya (2005) observed that in sapota cv. PKM (Sa) 4, the fruit quality attributes such as TSS, total sugar, reducing sugar, non - reducing sugars and ascorbic acid were significantly higher in severe pruning. On the other hand, acid content was found to decrease with increase in severity of pruning in sapota (Pradeepa, 2004 and Sathiya 2005).

**CANOPY MANAGEMENT THROUGH PLANT GROWTH RETARDANTS**

Agrawal and Dikshit (2008) made a study on the effect of plant growth regulators on growth and yield of sapota cv. cricket ball and he reported that spray of CCC 400 ppm at FBD, NAA 100 ppm at flowering as well as at pea stage of fruit development gave better response in growth and yield of sapota cv. Cricket Ball.

Agrawal and Dikshit (2008) observed that application of cycocel at Fruit bud differentiation stage resulted in the suppression of vegetative growth and was found effect in reducing the shoot length in sapota cv. Cricket Ball

## REFERENCES

Agrawal, S and S.N. Dikshit. 2008. Studies on the effect of plant growth regulators on growth and yield of sapota (Achras sapota l.) cv. cricket ball. Indian J. Agric. Res., 42 (3): 207 -211, 2008. | Chada, K.L. 1992. Strategy for optimization of productivity and utilization of sapota (Manilkara achras .L). Indian J.Hort., 49 (1): 1 –17. | Kumar, N. 2010. Introduction to horticulture. Oxford & IBH publishing co. pvt. Ltd, New Delhi. | Mathew, M. 2007. Effect of canopy management under different planting densities in Sapota (Manilkara achras (Mill.)Fosberg.) 'PKM 1'. M.Sc. (Hort.) Thesis, Submitted to Horticulture College and Research Institute, TNAU, Periyakulam. | Murugeswari, P. 2007. Canopy mangement in sapota (Manilkara achras (Mill.) Fosberg.) 'PKM (Sa) 4'. M.Sc. (Hort.) Thesis, Submitted to Horticulture College and Research Institute, TNAU, Periyakulam. | Pradeepha, L. 2004. Effect of canopy management and nutrients spray on vegetative growth, fruit set, yield and quality characters in sapota (Manilkara achras L.) cv. PKM 1, M.Sc., (Hort.) Thesis, Agricultural College and Research Institute, TNAU, Madurai. | Sathiya, V. 2005. Studies on the effect of different levels of training and pruning on yield and quality of sapota (Manilkara achras L.) cv .PKM (Sa) 4. M.Sc. (Hort.) Thesis, Submitted to Horticulture College and Research Institute, TNAU, Periyakulam. | Singh, G. 2010. Practical Manual on Canopy Management in Fruit Crops. Department of Agriculture & Cooperation, Ministry of Agriculture, Govt. of India, New Delhi.