



Crop Regulation Techniques in Guava (*Psidium guajava* L.) for Enhanced Yield and Quality

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Guava (*Psidium guajava* L.) is a fast-growing fruit crop in India and is regarded as highly nutritious and economically valuable. Guava plants bear two crops annually; those produced during the rainy season are tasteless and watery and therefore unpreservable. The primary aim of crop regulation in guava is to establish a resting period to allow the tree to redirect its energy, enabling it to yield a large volume of fruit and flowers during one of the two or three of the flushes. This plan aims to sustain quality at all times, raising productivity and revenues. Water availability, pests and diseases, and the commercial placement of a location are the main factors that determine the most important aspect of crop regulation, which is the choice of Bahar. Crops are controlled in many ways, and some of them include the use of special pesticides, trimming of shoots, removal of flower buds and denial of irrigation. By using these tactics, farmers can maximise production, produce higher quality guava, and increase profitability.

Keywords: Guava, Bahar treatment, Crop regulation, Pruning, Productivity.

Introduction

The guava (*Psidium guajava* L.) is an important fruit crop in India, which belongs to the Myrtaceae family. It is a native crop growing in tropical America, which is cultivated from Mexico up to Peru. It has been popular due to its nutritional value, low cost, beautiful smell, and taste. It is considered to be the apple of the tropics. It is among the hardiest fruit trees that can survive a wide range of soil and climate conditions. Guava is the fourth most important fruit crop in India, which comes after banana, mango and citrus. The district of Allahabad in Uttar Pradesh is renowned for producing the world's best guava, according to Mitra and Bose (1985). In addition to minerals, carbohydrates, crude fiber, flavonoids, thiamin, niacin, pyridoxine, cyanocobalamin, phenolic compounds, betacyanins, polyphenol, and carotene, the guava fruit is a rich source of vitamins A, B, and C (Nasier *et al.*, 2018). Quercetin's antiparasmodial action is believed to be due to its calming effect on the muscles lining the digestive tract. Diabetes can be treated using guava leaf polysaccharides, which humans can also utilize as an antidote.

Table 1: Nutritional composition of guava fruit

S. No.	Nutrients/ minerals	Nutrients/ minerals
1.	Water	80.80g
2.	Fiber	5.4g

S. No.	Nutrients/ minerals	Nutrients/ minerals
3.	Protein	2.55g
4.	Energy	68 kcal
5.	Carbohydrates	14.32g
6.	Vitamin C	228.3 mg
7.	Potassium	417 mg

Crop regulation refers to the control mechanism for regulating and controlling the growth and development of crops in order to maximize crop production, improve the quality of fruits, as well as decrease the cost of production. This involves modifying different horticultural procedures and practices to regulate the vegetative and reproductive cycle of the crop. The guavas yield different amounts of fruit during the year. The guavas get into blossom thrice in a year, namely Ambe bahar, Mrig bahar, and Hastha bahar. North India has a primary crop that is usually ready during the rainy season, which runs from July to mid-October.

Table 2: Blossom in guava

Flowering season	Flowering	Fruiting
Ambe Bahar (February)	February – March	July –August
Hastha Bahar (October)	October- November	March – April
Mrig Bahar (June)	June- July	November- December

Methods of crop regulation in guava

Numerous techniques have been used to stimulate fresh vegetative growth during the rainy season to provide a bumper crop in the winter that follows.

Shoot Pruning

Guavas up to 20 or 30 cm in length should have their terminal section removed in April to prevent Ambe bahar. It is always best to avoid severe trimming. To avoid the rainy-season crop, it was suggested to cut the spring flush growth that is currently underway. Pruning can help reduce tree size and improve fruit quality, claim Singh and Bal (2006). According to Lal (1983), trimming increases guava production.

Root Pruning

By excavating up to 7–10 cm of dirt in a 40–60 cm diameter circle around the tree trunk, the roots of the plant are exposed to the sun. The water is suspended for a month or two before blossoming. Water stress causes leaves to wilt and fall. The roots are again covered with a soil and FYM mixture before the planned first month of blooming, and they are watered right away. After that, irrigation is continued at suitable intervals. Plants consequently produce large amounts of fruit, blooms, and fresh vegetative growth. In some parts of Maharashtra, root pruning is utilized to increase the yield. There are visible roots; tiny roots are removed, and watering is stopped to allow the guava foliage to dry.

De-Blossoming

A range of herbicides and PGRs have been used to De-bloom rainy-period crops, increasing the amount of produce grown in the winter. Trees that thin or de-bloom in April and May may be used to harvest fruit from November to February and produce an abundance of blooms in June and July.

Flower thinning

Using a variety of chemical thinners, flower thinning—a critical process in fruit production—can be accomplished. Some of them include Naphthalene Acetic Acid (NAA), Naphthalene Acetamide (NAD), 2,4-Dichlorophenoxy Acetic Acid (2,4-D), Potassium Iodide (KI), 2-Chloroethyl Phosphonic Acid (Ethephon), 4,6-Dinitro-o-cresol (DNOC) and Urea. These compounds have shown varying levels of effectiveness in controlling the blossom population, increasing the fruit set and increasing the total production and quality.



Irrigation Techniques

In the northern plains, the tree dries and sheds its flowers at the end of the winter guava harvesting after the irrigation has been removed. June is the time of applying fertilizer, well-balancing manure, and irrigation. The tree then begins to be fruitful after 20-25 days, and its fruit will eventually be ready during the winter. It has been proposed that irrigation should not take place between the months of December and June or until the monsoon, to cause water tension depending on the circumstances.

Objectives

- Optimization of Yields: Fruit productivity gains.
- Improved Fruit Quality: Improve the quality of the fruit along with size, shape and colour.
- Greater Efficiency: Dropped production, labour and resource costs.
- Synchronized Production: To have a product to sell promptly with a consistent product to sell.
- Pest and Disease Management: Sustainable and cost-effective practices should be adopted.
- Environmental Conservation: Advertise the production methods and reduce the environmental effects.
- Long Manufacturing Season: Prolong the manufacturing season to increase profitability and appeal to the market needs.
- Optimal Resource Distribution: Proper use of resources such as water fertilizers.

Conclusion

The guavas bloom thrice every year (Feb-Mar, Jun-July, and Oct-Nov); hence, harvests are spaced during the winter period, spring and rainy period. However, this natural pattern of flowering interferes with the best yield realization during the required time. In order to overcome this, farmers intentionally create a resting phase in guava trees, which changes the trees' innate tendency to blossom and boosts fruit output during a particular time. De-blossoming, using pesticides or plant growth regulators (PGRs), trimming roots and shoots, withholding irrigation water, and bending shoots are some of the methods that can be used to achieve this artificial management.

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