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# Effects of Plant Growth Regulators on Growth, Fruit Setting and Quality of Guava

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Guava (*Psidium guajava* L.) belongs to family Myrtaceae is a native from Mexico or Central America and distributed throughout Tropical America and Caribbean region, it was introduce In India 17th century. it is very important tropical fruit crop grown throughout the tropical and sub-tropical areas, it is also called the apple of tropics. its commonly known as poor man's fruit. Guava is a very common and popular fruit due to its moderate price, nourishing value and good taste. The fruit (berry) is an excellent source of ascorbic acid and pectin (0.5-1.8%) but has low energy (Adsule & Kadam, 1995). Guava is one of the common and major fruit crops of India and considered as forth most important fruit in area and production and it can be grown in wide range of soil and climatic conditions. In fiscal year 2021, volume of guava produced in India is estimated to have amounted to 4.43 million metric tons. This was an increase from the previous fiscal year. The cultivation area of guava was about 304 thousand hectares in the country in 2021 (Published by Statista Research Department, Oct 16, 2021).

The most important Guava growing states are Utter Pradesh. Bihar. Madhya Pradesh and Maharashtra. Utter Pradesh is by far the most important Guava producing state in India, and Allahabad has the reputation of growing the best guava in the country as well as in the world. The common guava has quadrangular branchlets, oval to oblong leaves about 7.6 cm (3 inches) in length, and four-petaled white flowers about 2.5 cm (1 inch) broad. The fruits are round to pear-shaped and measure up to 7.6 cm in diameter; their pulp contains many small hard seeds (more abundant in wild forms than in cultivated varieties). The fruit has a yellow skin and white, yellow, or pink flesh. The musky, at times pungent, odour of the sweet pulp is not always appreciated. Propagation is usually by seeds, but improved varieties must be perpetuated by plant parts. The plant's hard dry wood and thin bark prevent cutting and conventional methods of grafting. Veneer grafting, using as rootstocks young plants in vigorous growth, gives excellent results. Guava fruits are processed into jams, jellies, and preserves and are common pastry fillings. Fresh guavas are rich in vitamins A, B,S and C; they are commonly eaten raw and may be sliced and served with sugar and cream as a dessert. It is a climacteric fruit and highly perishable in nature.

## Botanical Classification of Guava

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| **Botanical Name** | *Psidium guajava* |
| **Common Name** | Guava |
| **Major Group** | Dicot |
| **Family** | Myrtaceae |
| **Genus** | *Psidium* |
| **Species** | *Psidium guajava* |
| **Symbol** | PSGU |
| **Legal Status** | The plant is weedy and invasive in nature. |

## Physical Description and Cultivation

The common guava has quadrangular branchlets, oval to oblong leaves about 7.6 cm (3 inches) in length, and four-petaled white flowers about 2.5 cm (1 inch) broad. The fruits are round to pear-shaped and measure up to 7.6 cm in diameter; their pulp contains many small hard seeds (more abundant in wild forms than in cultivated varieties). The fruit has a yellow skin and white, yellow, or pink flesh. The musky, at times pungent, odour of the sweet pulp is not always appreciated.

## Plant Growth Regulators

Plants require light, water, oxygen, minerals and other nutrients for their growth and development. Apart from these external requirements, plants also depend on certain organic compounds to signal, regulates and control the growth of plants. These are collectively called Plant Growth Regulators or Plant Growth Hormones.

Auxins, Gibberellins, and Cytokinins are grouped into Plant growth promoters while Abscisic acid and Ethylene are grouped into Plant growth inhibitors.

## Types of Plant Growth

Primary and Secondary Growth.

The meristematic cells present at the root and shoot apices divide mitotically and increase the length of the plant body. This is known as primary growth. Secondary growth is referred to as the increase in the diameter of the plant body by the division of the secondary meristem.

Factors Affecting Plant Growth

There are four major factors that affect the growth of the plants.

They are:

**Light:** Plants are autotrophs. They require light for manufacturing their food. Limited light or the absence of it greatly affects the growth of the plant. The intensity of light, quality of light, and light duration influence the movement of stomata, chlorophyll synthesis, **photosynthesis**, and various other physiological factors. Light also encourages flowering and fruiting. During winters when the days are short, the growth of the plants is retarded.

**Water:** Plants cannot survive without water. Around 90% of the plant body comprises water. Plants become stressed in the absence of water and die. Water present in the soil is absorbed by the plant, which absorbs and transports the nutrients along with it. Water keeps the plant hydrated.

**Temperature:** Plant growth is greatly influenced by temperature. High temperatures speed up transpiration, photosynthesis, and germination processes. Low temperatures, however, slow down the growth of the plants.

**Nutrients:** Just like human beings, plants require proper nourishment for their **growth and development**. Soil nutrients are divided into macronutrients and micronutrients. Nitrogen, potassium, calcium, magnesium, sulfur, and phosphorus are the macronutrients required by the plants. The micronutrients include iron, copper, etc. Deficiency of these nutrients in plants ma

## Chemical Attributes of Guava Fruit

The vitamin-C content in fruits varied from 221.15 mg/100gmpulp in control ($T_0$) to 239.03 mg/100gm pulp in NAA 200 ppm ($T_3$). The result further indicated that all concentrations of NAA and $GA_3$had high value of vitamin-C content in comparison to mean value (228.79 mg/100g). The improvement in the ascorbic acid content of guava fruits might be due to increased synthesis of metabolites which can stimulate the synthesis of the ascorbic acid precursor (Orzorek and Angell, 1974). Similarly, Jain and Dashora (2011) reported maximum ascorbic acid (205.18mg/100g pulp) due to application of 200 ppm NAA treatment. This result is in accordance with the result obtained byGarasiya*et al.*(2013) in guava fruits.

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