

Effect of plant growth regulators on physiological and morphological parameters of papaya (*Carica papaya* L.)

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Abstract

Papaya (*Carica papaya* L.) is an important tropical fruit crop because of its nutrition properties economics properties and it is highly valued crop because it grows all around the year. However there are many environmental and physiological factors which effect the growth, flowering, fruit and yield of papaya. So, to enhance the productivity of papaya there are many PGRs used such as auxins, gibberellins, cytokinins, ethylene and growth retardants on physiological factors like photosynthesis, transpiration, nutrient uptake, respiration and various enzymetic activities. And it also effect the morphological parameters like size of fruit, flowering, leaf area, plant height and also the yield of papaya. It become very imporatnt to use PGRs at appropriate stage and at optimum concentration which will eventually increases the growth, yield, quality of fruit in papaya.

Keywords: Papaya, Plant Growth Regulator, Physiological Parameters, Morphological Parameters, Fruit Quality, Yield

Introduction

Papaya (*Carica papaya* L.) belongs to family Caricaceae and it is short lived tropical fruit crop and because of its cultivation advantage it is extensively grown in India due ti its high productivity, bearing nature, its uses in fresh consumption and many value added products. It is rich in many vitamin like A, C, antioxidant proteolytics enzyme papain calcium making it nutritionally and economically important. Despite its has many cultivation advantages, it also faces many physiological and morphological challenges like flower drop, fruit drop, poor fruit set, uneven growth, poor shelf life, irregular flowering which will lead to decrease in quality and yield of papaya. So, the PGRs can play here the major role for growth, yield and development of papaya.

Classification of plant growth regulators used in papaya

Growth promoters:

Auxin: NAA, IAA, 2,4 D

Function: Reduce fruit drop, enhance root growth and also increase fruit set.

Gibberellins: GA₃

Function: Delay senescence, increase height and also fruit size.

Cytokinins: BA, Kinetin

Function: Delay leaf senescence and promote cell division.

Ethylene:

Function: It regulates fruit ripening and also sex expression.

Growth Retardants:

Paclobutrazol, CCC:

Function: Reduces excessive vegetative growth and improve flowering.

Effect on Physiological Properties:

Plant growth regulators helps in photosynthesis by increasing chlorophyll content. Auxin and gibberellins increases the nutrient uptake and translocation of nutrient. Growth regulators like ethylene increases the respiration and induces ripening process while growth retardants reduces respiration.

Effect on Morphological Properties:

Plant growth regulators like gibberellins increases plant height, cytokinins, increases leaf area. Ethylene and auxin improve sex expression and flowering.

Conclusion

Plant growth regulators plays an very important role in growth, development, yield and the quality of papaya. It should be applied in proper concentration and a appropriate stage for better effectiveness. It is also essential in sustainable production of papaya.

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