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Role of plant growth regulators in Cucurbits

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Introduction

By altering a crop's rate, pattern, or both of its responses to the innate and exposed elements that control development from seed germination through the generation of new seeds through various physiological as well as postharvest effects, plant growth regulators can change the yield of a crop. The majority of vegetables farmed worldwide are in the cucurbit family, which is also a crop that responds well to growth regulators.

PGRs are essential or fundamental to improving growth, yield, and quality. The application of GA3 at 50–100 ppm boosts growth, the quantity of male flowers, and the size of the fruits. By suppressing the male flowers, ethrel at 400–500 ppm increased the amount of female flowers, improved the maturity cycle, and improved the sex ratio. Auxin 50-100 ppm also has a significant impact on growth. The majority of vegetables farmed worldwide are in the cucurbit family, which is also a crop that responds well to growth regulators.

The term 'Plant Growth Regulators' is relatively new in use. In earlier literature, these were mentioned as Hormones. "Hormone" is a Greek word derived from "hormao" which means to stimulate. Thimonn (1948) suggested the use of the term phytohormone in place of hormone of plants. He defined phytohormones as the organic substances which are produced naturally in plants, synthesized in one part and usually translocated to other part where in every small quantity influence the growth and other physiological functions of the plants. The term growth regulator is used for the substances which work similar to phytohormone but synthetic in nature.

AUXINS

The existence of auxin was proposed by Charles Darwin (1880). While working on Canary grass (Phalaris canariensis), he observed that apical tips of seedlings show phototropism. As a result of growth differential in shaded and illuminated side of coleoptile. curvature was noted. When the tip of coleoptile was excised, no curvature

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response was noted. It indicates that some substance was diffused from agar block to coleoptile that resulted into elongation and as a result coleoptile bent. That substance was known as IAA. Auxin is synthesized in shoot-tip region particularly in young expanding leaves of the apical region, developing embryo and in developing fruits etc. The synthesis begins with the synthesis of amino acid tryptophan. Therefore, tryptophan is known as precursor of IAA. Auxins have polar movement i.e., apex to downward.

GIBBERELLINS

Gibberellin was discovered by Kurosawa, a Japanese scientist in 1926. It was first extracted from the fungus Giberella fujikuroi (*Fusarium moniliforme*). The fungus is a causal organism of "foolish seedling of rice" or commonly called bakanae disease of rice. The disease infected plants were very tall, seedless and pale in colour. West and Phinney (1956) product of higher plants. It was first isolated from immature seeds of Phaseolus cocineus by MacMillan and Suter (1958). Gibberellins are synthesized in young leaves, roots and immature shoots and move in all directions and in all tissues including phloem and xylem.

CYTOKININ

The term cytokinin is a generic name for the substance, which promotes cell division and effect other growth regulatory functions of the plants. Cytokinin is also known as phytokinin. Haberlandt (1913) provided evidence that the substance from the phloem induces cell division. Skoog (1955) demonstrated that when pith tissues of Nicotiana tabaccum were separated from vascular tissues, they grew without cell division. Zeatin is of natural occurrence and kinetin is synthetic.

ETHYLENE

Ethylene is the only gaseous hormone which stimulates growth. Gane (1934) established that ethylene was natural product of ripening fruit. Evidences for ethylene production appeared from leaves, flowers, seeds and roots. Soon after, it was realized that ethylene had a profound regulatory activity and it could be regarded as a plant hormone.

ABSCISIC ACID (ABA)

In 1961 Liu and Carns isolated a substance from cotton fruit which stimulated the abscission of debladed cotton petioles. They called this substance abscisin-I. But the structure of this substance was not determined. Its detection led to the discovery of another substance, which Ohkuma and colleagues isolated from young cotton fruit and termed it as abscisin-II.

Important Role of Plant Growth Regulators in Vegetable Production:

The role of plant regulators in various physiological and biochemical processes in

plants is well known. Growth regulators are known to affect

- Parthenocarpy
- Seed germination,
- Seed dormancy
- Flowering
- Sex Expression
- Gametocides
- Hybrid Seed Production
- Fruit Set

Role of plant growth regulators in Cucurbits

Cucurbits, which are members of the cucurbitaceae family and make up a sizable group of vegetables, are widely cultivated in India and other tropical and subtropical regions of the world. Some cucurbits, such as cucumber and chow-chow (chayote), are cultivated in greenhouses and outdoors in temperate zones. The fruits of cucurbits can be eaten raw as a dessert (muskmelon and watermelon), cooked (bottle gourd, bitter gourd, sponge gourd, ridge gourd, summer squash, squash melon, pumpkin, etc.), or processed into pickles (gherkins, pointed gourd), jam (pumpkin), or candied (ash gourd). Summer squash and bottle gourd are two examples of cucurbits with a robust rind that are utilised for ornaments, utensils, containers, and other items. The sponge gourd's dried fruits are Cucurbits, which are members of the cucurbitaceae family and make up a sizable group of vegetables, are widely cultivated in India and other tropical and subtropical regions of the world. Some cucurbits, such as cucumber and chow-chow (chayote), are cultivated in greenhouses and outdoors in temperate zones. The fruits of cucurbits can be cooked (bottle gourds, bitter gourds, and sponge gourds are used as scouring pads), eaten fresh as a dessert (muskmelon and watermelon), or in salads (cucumber and long melon). Decor items include the colourful ornamental gourds, which come in a range of sizes and styles. The majority of cucurbits are annuals that are direct sowed and grown from seed.