

How Gibberellin Helps in Plant Growth

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DESCRIPTION

In the realm of plant biology, hormones play a pivotal role in regulating various physiological processes. Among these hormones, Gibberellin (GA) stands out as a remarkable growth regulator that influences plant development, from seed germination to flowering and fruiting. Since its discovery in the early 20th century, scientists have been captivated by the fascinating effects of gibberellin on plant growth and its potential applications in agriculture. This commentary explores the significance of gibberellin as a growth hormone and delves into its multifaceted roles within the plant kingdom.

Gibberellin: Nature's growth elixir: Gibberellins are a group of naturally occurring plant hormones that possess the ability to trigger elongation in stems, promote seed germination, stimulate flowering, and enhance fruit development. They were initially discovered in Japan during the early 20th century when scientists observed a peculiar phenomenon known as "foolish seedling disease" in rice plants. It was later revealed that this disease was caused by a fungal infection that produced a substance named gibberellin, leading to excessive stem elongation.

Seed germination: Awakening life: One of the most remarkable effects of gibberellin lies in its ability to break seed dormancy and initiate germination. Seeds possess a built-in mechanism to prevent premature germination, and gibberellin acts as a key signal to override this dormancy. By stimulating the production of hydrolytic enzymes, gibberellin induces the breakdown of stored reserves within the seed, providing the necessary energy and nutrients for seedling emergence. This hormone also influences the balance between germination and dormancy, allowing plants to adapt to environmental cues such as temperature and light conditions.

Stem elongation: Reaching new heights: Gibberellin's impact on stem elongation is truly remarkable. It promotes cell division and elongation by stimulating the synthesis of proteins and enzymes that loosen the cell wall structure. This enables cells to expand rapidly, resulting in increased plant height. Farmers have long exploited this property of gibberellin to enhance the growth of certain crops, such as wheat and barley, thereby increasing their yields. Additionally, gibberellin has been instrumental in

alleviating the "dwarfism" trait in some plant species, helping to breed varieties with improved stature and better agricultural productivity.

Flowering and fruit development: Nature's timekeepers: Another crucial role of gibberellin is its involvement in the regulation of flowering and fruit development. Plants rely on complex internal signaling pathways to coordinate their reproductive processes. Gibberellin plays a pivotal role in this coordination by influencing the transition from the vegetative phase to the reproductive phase. It promotes the formation of floral buds and ensures their successful development into flowers. Furthermore, gibberellin facilitates fruit set and enlargement, contributing to higher crop yields. Understanding the precise mechanisms underlying gibberellin's involvement in these processes has been instrumental in manipulating flowering time and fruit quality in agricultural practices.

Agricultural applications: Harnessing the power of gibberellin: The multifaceted roles of gibberellin have found extensive applications in agriculture. By manipulating gibberellin levels, farmers can influence the growth, development, and yield of various crops. For instance, the controlled application of gibberellin can lead to elongated stems, reducing lodging in cereal crops and improving overall harvest quality. Gibberellin treatments have also been employed to induce seedless fruits, enhance fruit size, and improve the uniformity of fruit ripening. Additionally, gibberellin's involvement in flowering regulation has allowed for the development of plants with altered flowering times, enabling cultivation in different regions and optimizing.

CONCLUSION

Gibberellin, the plant hormone with the power to shape growth and development, continues to captivate scientists and researchers alike. From its discovery in rice plants to the present day, our understanding of gibberellins has expanded significantly, unraveling their roles in various aspects of plant biology. By harnessing the potential of gibberellins, we have unlocked new opportunities for improving crop production, extending the availability of ornamental plants, and enhancing stress tolerance in agriculture.

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