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Perspective

The physiology of seed germination and optimal seedling establishment in agriculture

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ABOUT THE STUDY

Crop physiology is the study of how physiological systems in crops interact to produce community responses in whole plants. Crop physiology is the study of methods to effectively manage agriculture through the application of information of plant development. An in-depth study of plant metabolism can help with several elements of both agriculture and horticulture and offer alternatives that are relevant to both sectors. Acknowledging the physiological functions associated in seed germination, seedling development, crop formation, vegetative growth, flowering, seed and fruit setting, crop maturity, phytohormones interaction, nutrient physiology, stress (biotic/abiotic) physiology, etc., provides a proper scientific basis for effective monitoring and advantageous deception of these manifestations. Though economic production, which is the result of these events, and plant health are what we are concerned with in farming, plant physiology offers the foundation for boosting crop yield. In order to provide more effective crop management solutions, crop physiology investigates these occurrences.

Morphology of seeds

The most vital element in agriculture is seed. Several internal as well as external factors affect seed germination and optimal seedling establishment. Evaluating the numerous morphological and physiological modifications that occur throughout germination is made much easier with understanding of seed physiology. Seed dormancy results from every deviation from such procedures. In agricultural production, it's essential that harvested seed is not utilized right away for the subsequent crop due to the dormant of the seed. Crop physiologists have developed various methods for disrupting the seed dormancy by recognizing the roots and impacts of this condition.

Plant growth regulators

Plants possess intrinsic growth control mechanisms that operate with very low concentrations of chemicals known as phytohormones, plant development compounds, or plant growth regulators. By administrating several hormones at the proper plant maturity and age, blooming, germination, and fruit development were all modulated.

Crop index

The net outcome of photosynthesis rate is the difference between the total amount of dry mass generated and the preculture consumed during breakdown. The distribution of dry mass throughout the different plant tissues affect the economic yield. Farmers are intrigued in how total dry material is distributed throughout the major plant organs because they are more preoccupied with how it is allocated in relation to economic yield.

Post-harvest physiology

Agriculture and horticultural post-harvest deficits are very distressing to the farming community. The two primary variables affecting physiological changes that degrade the post-harvest integrity of grains are humidity and temperature. In order to effectively preserve grains, moisture content must be controlled and low temperatures should be sustained. Horticultural crops endure more post-harvest mortality than other types of crops since they are consumable by nature.

Nutriophysiology

The essential element to consider in investigating agricultural physiology is nutriophysiology. There are about seventeen essential components for a crop to develop healthily. Determination of vital nutrients, ion uptake mechanisms, indications of their inadequacy, and appropriate actions have all been made much easier by employing nutriophysiology knowledge. Evaluating the toxicity characteristics of nutrient supplements is also essential. Evaluating plant physiology can assist to comprehend how fertilizers are utilized and how crops absorb nutrients.

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