

Abiotic Stress Tolerance In Crop Plants Breeding And Biotechnology

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Advances in Plant Tolerance to Abiotic Stresses | IntechOpen

The stability of yield is determined by the tolerance of the plant to abiotic stresses, such as drought, cold, salt, and heat. Considerable research in the public and private sectors is devoted to the development of abiotic stress tolerance in plants, a good component of this being at the level of high throughput gene discovery and gene evaluation.

Abiotic Stress Tolerance in Plants: An Industry Perspective

Although conventional breeding has contributed significantly towards crop improvement for abiotic stress tolerance, more efficient and modern technologies with immediate impacts are surely needed to address this challenge (Driedonks et al., 2016).

Abiotic Stress Tolerance In Crop

Abscisic acid is the most important phytohormone that confers abiotic stress tolerance in crop plants (Shinozaki and Yamaguchi-Shinozaki, 2000; Schroeder et al., 2001). In stress conditions like drought, extreme temperature, and high salinity, content in plants increases considerably, inspiring stress-tolerance effects that help plants, adapt, and survive under these stressful situations (Ng ...

Hormone balance and abiotic stress tolerance in crop plants

Chilling, a sort of cold stress, is a typical abiotic ecological stress that impacts the development as well as the growth of crops. The present study was carried to investigate the role of ascorbic acid root priming in enhancing tolerance of tomato seedlings against acute chilling stress.

(PDF) Breeding for Abiotic Stress Tolerance in Crop Plants

Crop Phenomics for Abiotic Stress Tolerance in Crop Plants Joshi, R., Karan, R., 2013. Physiological, biochemical and molecular mechanisms of drought tolerance in

Abiotic stress - Wikipedia

We then discuss the recent progress in the engineering of hormone-associated genes aimed at improving crop stress tolerance. Hormones and the response to abiotic stress. Phytohormones are essential for the ability of plants to adapt to abiotic stresses by mediating a wide range of adaptive responses [13, 14, 15, 16 •].

(PDF) Crop Phenomics for Abiotic Stress Tolerance in Crop ...

The latest update on improving crop resistance to abiotic stress using the advanced key methods of proteomics, genomics and metabolomics. The wellbalanced international mix of contributors from industry and academia cover work carried out on individual crop plants, while also including studies of model organisms that can then be applied to specific crop plants

Hormone balance and abiotic stress tolerance in crop ...

PDF | On Dec 14, 2017, Hari Prakash Meena and others published Breeding for Abiotic Stress Tolerance in Crop Plants | Find, read and cite all the research you need on ResearchGate

Reactive oxygen species and antioxidant machinery in ...

In addition, more and more refined genome engineering methods, e.g., on the basis of CRISPR-Cas9, allow altering plant genomes with increasing precision and developing crops with superior tolerance to abiotic stressors. The mechanisms of stress tolerance are sophisticated and may vary in different cells, tissues, and organs.

Engineering abiotic stress tolerance via CRISPR/ Cas ...

The use of bioeffectors, formally known as plant biostimulants, has become common practice in agriculture and provides a number of benefits in stimulating growth and protecting against stress. A biostimulant is loosely defined as an organic material and/or microorganism that is applied to enhance nutrient uptake, stimulate growth, enhance stress tolerance or crop quality.

Arbuscular Mycorrhiza: Approaches for Abiotic Stress ...

Research highlights Various abiotic stresses lead to the overproduction of reactive oxygen species (ROS) in plants which are highly reactive and toxic and cause damage to proteins, lipids, carbohydrates, DNA which ultimately results in oxidative stress. The antioxidant defense machinery protects plants against oxidative stress damages. Plants possess very efficient enzymatic (superoxide ...

Abscisic Acid and Abiotic Stress Tolerance in Crop Plants

This implies a major breakthrough in crop breeding for stress tolerance. Given that the diversity for stress tolerance within traditional crops (including landraces) is likely to be too narrow to achieve this goal (Colmer et al., 2005), stress tolerance genes must be identified in extremophiles and then introduced into traditional crops.

Learning from halophytes: physiological basis and ...

Reactive oxygen species and antioxidant machinery in abiotic stress tolerance in crop plants. Gill SS(1), Tuteja N. Author information: (1)Plant Molecular Biology Group, International Centre for Genetic Engineering and Biotechnology, Aruna Asaf Ali Marg, New Delhi 110 067, India.

Reactive oxygen species and antioxidant machinery in ...

Abiotic stress is the negative impact of non-living factors on the living organisms in a specific environment. The non-living variable must influence the environment beyond its normal range of variation to adversely affect the population performance or individual physiology of the organism in a significant way.

Agronomy | Special Issue : Molecular Mechanisms of Abiotic ...

Plants are subjected to a wide range of environmental stresses which reduces and limits the productivity of agricultural crops. Two types of environmental stresses are encountered to plants which can be categorized as (1) Abiotic stress and (2) Biotic stress. The abiotic stress causes the loss of major crop plants worldwide and includes radiation, salinity, floods, drought, extremes in ...

Improving Crop Resistance to Abiotic Stress | Wiley Online ...

Singh LP, Gill SS, Tuteja N (2011) Unraveling the role of fungal symbionts in plant abiotic stress tolerance. Plant Signal Behav 6:175 – 191 PubMed CrossRef Google Scholar Slesak I, Miszalski Z, Karpinska B et al (2002) Redox control of oxidative stress responses in the C3-CAM intermediate plant Mesembryanthemum crystallinum .

Abiotic Stress Physiology of Horticultural Crops ...

During the last 50 years, it has been shown that abiotic stresses influence plant growth and crop production greatly, and crop yields have evidently stagnated or decreased in economically important crops, where only high inputs assure high yields. The recent manifesting effects of climate change are considered to have aggravated the negative effects of abiotic stresses on plant productivity.

Plants | Special Issue : Abiotic Stress Tolerance in Crop ...

To date, there are no books covering horticultural crop-specific abiotic stress tolerance mechanisms and their management. Addressing that gap, the book is divided into 2 sections, the first of which highlights recent advances in the general aspects of abiotic stress tolerance like the role of hormones, reactive oxygen species, seed treatments, molecular mechanisms of heat tolerance and heavy ...

Biotic and Abiotic Stresses in Plants | IntechOpen

Abiotic stresses, such as temperature extremes, drought, salinity, and heavy metals are major factors limiting crop productivity and sustainability worldwide. Abiotic stresses disturb plant growth and yield formation. Several chemical compounds, known as plant growth regulators (PGRs), modulate plant responses to biotic and abiotic stresses at the cellular, tissue, and organ levels.

Potential Mechanisms of Abiotic Stress Tolerance in Crop ...

Hormone balance and abiotic stress tolerance in crop plants Zvi Peleg and Eduardo Blumwald Plant hormones play central roles in the ability of plants to adapt to changing environments, by mediating growth, development, nutrient allocation, and source/sink transitions.

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