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Abscisic Acid—A Hormonal Long-Distance Stress Signal in Plants Under Drought and Salt Stress

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ABSCISIC ACID AS A STRESS HORMONE IN PLANTS

When abscisic acid (ABA) is applied externally to plants, their water relations are improved. ABA reduces water loss by promoting stomatal closure and can increase water uptake into roots. ABA application also promotes characteristic developmental changes that can help the plant cope with a range of environmental stresses. Examples of such changes are the restricted growth of shoots, the reduction in leaf surface area, a stimulation of root extension, lateral root growth, and root hair development. All these effects of ABA application, together with the observation that environmental stress stimulates ABA biosynthesis and ABA release from sites of synthesis to the sites of action, suggest a role for ABA as a stress hormone in plants.

MECHANISMS TO INCREASE THE ABA CONCENTRATION AT THE PRIMARY SITE OF ACTION AT THE STOMATA

It was shown previously [1] that the biosynthesis and metabolism of ABA are stimulated by the plant water deficit when the bulk leaf turgor is reduced close to zero. Stomatal reactions, however,