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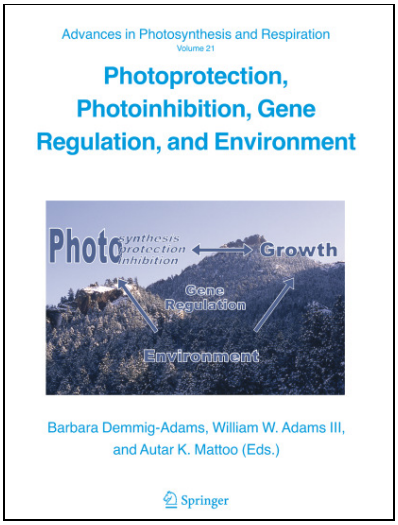

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Photoprotection, Photoinhibition, Gene Regulation, and Environment

Photoprotection, Photoinhibition, Gene Regulation, and Environment examines the processes whereby plants monitor environmental conditions and orchestrate their response to change, an ability paramount to the life of all plants. "Excess light", absorbed by the light-harvesting systems of photosynthetic organisms, is an integrative indicator of the environment, communicating the presence of intense light and any conditions unfavorable for growth and photosynthesis. Key plant responses are photoprotection and photoinhibition. In this volume, the dual role of photoprotective responses in the preservation of leaf integrity and in redox signaling networks modulating stress acclimation, growth, and development is addressed. In addition, the still unresolved impact of photoinhibition on plant survival and productivity is discussed. Specific topics include dissipation of excess energy via thermal and other pathways, scavenging of reactive oxygen by antioxidants, proteins key to photoprotection and photoinhibition, peroxidation of lipids, as well as signaling by reactive oxygen, lipid-derived messengers, and other messengers that modulate gene expression. Approaches include biochemical, physiological, genetic, molecular, and field studies, addressing intense visible and ultraviolet light, winter conditions, nutrient deficiency, drought, and salinity.

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