

Chapter 10

Physiological, biochemical and molecular adaptation mechanism of photosynthesis and respiration under challenging environments

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Abstract

Photosynthesis and respiration are two central and basic physiological processes in regulation to carbon budget and carbon sink in terrestrial ecosystem, as well as assessment and feedback of highly variable and fluctuating environmental conditions. Elevated CO₂, salinity, alkalinity, drought, flood, nutrient deficiency and toxicity, extreme cold and heat and various natural and anthropogenic pollutants are critical challenges in near future and their primarily target is to alteration of photosynthetic and respirational processes, which ultimately influence the final yield potential of major agricultural crops. However, plants adopt themselves to these