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Mitochondrial Metabolism; V. Regulation of the Benson-Calvin Cycle in C4 Plants; VI. Regulation of Product Synthesis in Leaves of C4 Plants; VII. Summary; References; Chapter 5. Leaf Structure and Development in C4 Plants; I. Introduction; II. Kranz Anatomy and Biochemical Compartmentation; III. Development of the C4 Syndrome; IV. Summary; References; Chapter 6. Modeling C4 Photosynthesis; I. Introduction; II. Basic Model Equations; III. Analysis of the Model; IV. Summary; References

Part III: Ecology of C4 Photosynthesis

Chapter 7. Environmental Responses; I. Introduction; II. Light; III. Nitrogen; IV. Water; V. Temperature; VI. Summary; References; Chapter 8. Success of C4 Photosynthesis in the Field: Lessons from Communities Dominated by C4 Plants; I. Introduction; II. The C4-Dominated Tallgrass Prairies of North America; III. The C4-Dominated Neotropical Savannas; IV. Summary; References; Chapter 9. C4 Plants and Herbivory; I. Introduction; II. Unique Features of C4 Species That May Affect Herbivores and Plant Responses to Herbivory

III. How Important Are C4 Characteristics to Herbivory Tolerance and Resistance? IV. Summary; References; Chapter 10. The Biogeography of C4 Photosynthesis: Patterns and Controlling Factors; I. Introduction; II. The Global Distribution of C4 Photosynthesis; III. Factors Controlling the Distribution of C4 Species; IV. C4 Plants in the Future; V. Summary; References; Part IV: The Evolution of C4 Photosynthesis; Chapter 11. The Origins of C4 Genes and Evolutionary Pattern in the C4 Metabolic Phenotype; I. Introduction; II. The Evolution of C4 Genes

III. The Evolution of C4 Metabolism as Evidenced in C3-C4 Intermediates

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#### Sommario/riassunto

Due to many issues related to long-term carbon dynamics, an improved understanding of the biology of C4 photosynthesis is required by more than the traditional audience of crop scientists, plant physiologists, and plant ecologists. This work synthesizes the latest developments in C4 biochemistry, physiology, systematics, and ecology. The book concludes with chapters discussing the role of C4 plants in the future development of the biosphere, particularly their interactive effects on soil, hydrological, and atmospheric processes.

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