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Autore	Goudriaan J.
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Nota di contenuto	1 Introduction -- 1.1 Levels of understanding of crop growth -- 1.2 Growth factors and production situations -- 1.3 CO2 assimilation as a basis -- 1.4 Some general modelling considerations -- 1.5 Outline of the book -- 2 The main seasonal growth pattern -- 2.1 Introduction -- 2.2 The growth phases -- 2.3 Exponential-linear growth: one equation -- 2.4 A special case: rm, cm,p1 and s are constant -- 2.5 Application for variable weather conditions -- 2.6 Generalization on approaching the senescence phase -- 2.7 A term for losses due to maintenance respiration -- 2.8 Additional exercises -- 2.9 Solutions to the exercises -- 2.10 Symbols and acronyms used in Chapter 2 -- 3 Climatic factors -- 3.1 Importance of the diurnal course -- 3.2 The daily progress of the incident global radiation -- 3.3 Temperature -- 3.4 Humidity -- 3.5 Wind speed -- 3.6 Annual temperature course -- 3.7 Additional exercises -- 3.8 Solutions to the exercises -- 3.9 Symbols and acronyms used in Chapter 3 -- 4 Assimilate flow and respiration -- 4.1 Introduction -- 4.2 Growth and respiration -- 4.3 Short-circuiting the assimilate pool on the long-term -- 4.4 Growth respiration and chemical composition -- 4.5 Maintenance respiration -- 4.6 Additional exercises -- 4.7 Solutions to the exercises -- 4.8 Symbols and

Sommario/riassunto

We dedicate this book to professor C. T. de Wit (1924 - 1993) who initiated Production Ecology as a school of thought at the Wageningen Agricultural Univer- sity (see Rabbinge et at. , 1990). To acknowledge the leading role of C. T. de Wit, a recently formed graduate school at

this university in Production Ecology was named after him. Production Ecology is the study of ecological processes, with special attention to flows of energy and matter as factors that determine the productivity of ecological systems. Agro-ecosystems are a special case of ecosystems which are much better suited for the productivity approach than natural ecosystems are. This is the reason for the strong role of agricultural research in production ecology. On the other hand, it must be recognized that the spatial heterogeneity of natural ecosys- tems and their species richness may alter some ecophysiological relationships. However, the basic physical, chemical and physiological processes will be the same. De Wit introduced the state variable approach as the basis for simulation mod- elling. In this approach the floating character of nature is schematized into a series of snapshots over time in which the states are frozen at each separate moment. The current state determines how the rates of change will lead to the next snapshot. This way of thinking enables a clear and workable representation of interacting simul- taneous processes, without compromising on the mathematics.