Maillard, P., Bonhomme, R. (ed.): **Fonctionnement des Peuplements Végétaux sous Contraintes Environmentales.** (Les Colloques, no. 23.) - Editions INRA, Paris 2000. ISBN 2-7380-0911-5. 565 pp., FF 270.00, EUR 41.16.

The study of the functioning of plants in response to its environment is based, on one hand, on a good knowledge of plant behaviour (including adaptation and acclimation) under different environmental conditions, and, on the other hand, modification of environment due to plant adaptation. This problem is a framework of the present book, based above all on papers contributed to a symposium held in Paris, 20-21 January 1998.

The volume is divided into 5 chapters containing together 27 papers (in French with English summaries) of 94 authors from France (88), Canada (2), the UK (2), Korea (1), and Romania (1).

The chapter I—Approche compartimentale du fonctionnement des couverts végétaux—presents 6 papers dealing with principles of compartment approach to plant stands, the main aspects being carbon/nitrogen metabolism, and joint limitation of photosynthesis, growth, and related traits by main environmental factors, and modelling of the processes studied. Further papers are devoted to short- and long-distance transport, partitioning between source and sink organs, and modelling these processes, growth and maintenance respiration, effect of partial defoliation, transpiration stream, adaptation mechanisms, growth limitation by light and nitrogen, limitation of leaf photosynthesis by electron transport, and carboxylase activity of ribulose-1,5-bisphosphate carboxylase/oxygenase, modelling of environment affected by plant functioning, *etc.* Interesting is a description and results obtained in a big growth cabinet (10 m^2, height 2.8 m) which allows, *e.g.*, growing of fruiting trees.

Five papers of the Chapter II—Fonctionnement des couverts végétaux basé sur une description spatialisée de la structure—are devoted to functioning of canopies with respect to their spatial structure (detailed analyses such as modelling of plant ontogeny, structure and architecture, transpiration and photosynthesis affected by light distribution, 3D models of crop growth and structure, modelling growth analysis, root system architecture, *etc.*). Also in this chapter, methodology and experience with methods used are discussed (*e.g.*, SPAD chlorophyll meter).

Four papers of the Chapter III—Effets des contraintes minérales sur le fonctionnement des couverts végétaux—summarize the effect of shortage of mineral elements on plant stand (modelling mineral nutrition, rhizosphere functioning, growth analysis, effect of nitrogen and phosphorus shortage, light distribution and competition in canopy, shoot/root ration, *etc.*).

Ten papers of the Chapter IV—Effets des contraintes biotiques sur le fonctionnement des couverts végétaux—focus on effects of biological stresses on canopy [effect of light quality inside the ecosystem on morphogenesis, phytochrome effect, model of architecture taking photomorphogenesis and stand density into account, modelling light distribution in canopy, competition for light between crops and weeds, competition for water, transpiration, photosynthesis and stomatal conductance, modelling of competition for water as affected by root distribution, soil physical processes, modelling pathogen effect on plant functioning and effect on photosynthesis, stand functioning under influence of brown rust (*Puccinia recondita*), *etc.*].

The Chapter V—Identification de différences génotypiques dans la réponse aux contraintes environnementales—discuss in two papers the cultivar and genotypic differences in wheat under suboptimal nitrogen supply and under competition with weeds. New ways in non-chemical weed control such as genetic variability and breeding of new cultivars, competition potential, nitrogen fertilization, *etc.* are presented.

The book presents an extensive review of French contribution to our knowledge of ecosystem functioning under environmental stresses, and is a good source of recent literature. It is well produced in the standards of the series "Les Colloques" published by Institut National de la Recherche Agronomique in Paris. Individual papers are supplemented by a list of references (together more than 1100 citations). However, the readers would welcome short subject and plant indexes.

The book, interesting for plant scientists and many other specialists, is available from INRA Editions, Route de St Cyr, F-78026 Versailles Cedex, France.

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