

Larcher, W.: **Physiological Plant Ecology. Ecophysiology and Stress Physiology of Functional Groups.** Fourth Edition. - Springer, Berlin - Heidelberg - New York - Hong Kong - London - Milan - Paris - Tokyo 2003. 513 pp. EUR 39.95. ISBN 3-540-43516-6.

Physiological plant ecology is the science discipline focused on plant life under the influence of different abiotic and biotic factors. It tries to elucidate the mechanisms of responses to these factors in diverse plant groups and species growing in broad spectrum of habitats. The textbook of Walter Larcher belongs certainly to the most successful in the field. Since the first edition of the book in the year 1975 the plant physiology and ecology advanced so rapidly that each new edition required deep revision and extension. Therefore only a small amount of original material has been used and this fourth edition has been completely revised and updated with current state-of-art knowledge.

The book is introduced by the chapter which survey general characteristics of the atmosphere, the hydrosphere and the lithosphere, and the interactions among organisms in the "phytosphere". The second part of this chapter is focused on radiation and climate. The following chapter 2 deals with carbon metabolism. It draws reader's attention to photochemical processes, pathways for carbon dioxide fixation, photorespiration, and respiration in the cell, gas exchange in leaves including stomatal regulation and responses to different environmental factors, carbon budget of the whole plant and of the whole stand, and energy conversion by plant cover. The chapter 3 is devoted to mineral nutrition. The topics discussed include absorption and transport of different minerals, their deposition and utilization in the plant, elimination from

the plant, metabolism of main minerals and mineral cycling in plant communities. Plant water relations are the field of the fourth chapter. This chapter is addressed to water relations of plant cells, uptake of water by plant roots, short- and long-distance transport of water, transpiration, water balance of a plant, and water relations in plant communities. The fifth chapter is devoted to growth and development as affected by different endogenous and exogenous factors. Plant development as an indicator of weather characteristics and climatic changes is also considered. In the last chapter plants under stress are examined in detail. Topics covered include stresses induced by strong solar radiation, ultraviolet radiation, extreme high and low temperatures, oxygen deficiency, drought, salinity, excess of heavy metals, and pollutants.

The readable text of each chapter is accompanied with numerous figures and tables. Quite new is presentation of "boxes" in which special tasks are solved by experts in the respective field. The whole book includes an extensive bibliography, subject index, lists of abbreviations, symbols, units and their conversions, and colour maps of global distribution of radiation, biomes of the earth, annual net primary production, occurrence of low temperature, and dry and wet regions.

This outstanding textbook can be recommended to everybody interesting in this field.

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