

Larcher, W.: **Ökophysiologie der Pflanzen.** Leben, Leistung und Streßbewältigung der Pflanzen in ihrer Umwelt. 5<sup>th</sup> Ed. - Verlag Eugen Ulmer, Stuttgart 1994. ISBN 3-8252-8074-8. 394 pp.

Larcher, W.: **Physiological Plant Ecology.** Ecophysiology and Stress Physiology of Functional Groups. 3<sup>rd</sup> Ed. - Springer-Verlag, Berlin - Heidelberg - New York - Barcelona - Budapest - Hong Kong - London - Milan - Paris - Tokyo 1995. ISBN 3-540-58116-2. 506 pp., hard cover DEM 68.00, öS 496.40, sFr 65.50.

The textbook of W. Larcher (1929), professor at the University in Innsbruck, Austria, belongs certainly to the most successful manuals that ever existed. Its fifth, completely revised German edition (the first one appeared in 1973 - for review see *Photosynthetica* 8: 68-69, 1974), appearing also in English translation, has been preceded by three editions and corrected printings in English, and also by editions in Spanish, Russian, Chinese, Portuguese, Czech, and Italian. The book contains 347 (348 in the English edition) figures and 78 tables that present—as an inseparable part of the text—an excellent material for teaching and learning.

In six large chapters all aspects of plant ecophysiology are explained. Chapter 1 deals with plant environment: surroundings of plants (atmosphere, hydrosphere, lithosphere and the soil, phytosphere as a part of ecosphere), radiation, and climate. Chapter 2 is devoted to carbon utilization and dry matter production: cell carbon metabolism (photochemistry and photosynthesis, photorespiration and glycolate pathway, respiration and release of energy), gas exchange in plants ( $\text{CO}_2$  and  $\text{O}_2$  transfer and exchange, diffusion processes, stomata functioning, maximum activities of individual processes in nature, and in different species, photosynthetic parameters during leaf development and senescence, effect of environmental factors on photosynthesis), carbon budget of the whole plant ( $\text{CO}_2$  balance, photosynthate utilization, and growth rate), carbon balance of plant communities, and energy conversion by plant cover (energy conversion by photosynthesis, energy content in biomass, efficiency of energy utilization). Chapter 3 discusses the utilization of mineral elements: soil as nutrient source for plants, uptake, utilization, deposition and elimination of minerals in plants, nitrogen assimilation, metabolism and partitioning, habitat-related aspects of mineral metabolism (acidic and basic substrates, calcicole and calcifuge plants, oligotrophic habitats), and mineral cycling in plant communities. Water relations are dealt with in Chapter 4: on cell level, mainly cell water potential and dynamic equilibrium of cell water are discussed. In the whole plant, soil-plant-atmosphere continuum, processes involved in water loss from plants, and water balance are treated. Finally, water relations and economy in a community and plant stand are explained. In Chapter 5, environmental effects on plant growth and development are discussed: the role of phytohormones in the regulation of growth and development, stages in the plant life (embryonic phase, germination, vegetative and reproductive phases, senescence), seasonality of growth and development (patterns of life history, synchronization of growth and climatic rhythms, winter dormancy, phenology). In the last Chapter 6, the effects of stress factors on plants are summarized: stress - disturbance and syndrome (what is stress and what happens during stress, how to recognize stress, stress and plant life), natural environmental constraints (radiation, temperature, oxygen deficiency, drought, salinity), and anthropogenic stress (man-made pollutants, pollution injury, effects on ecosystem and at the global level).

The textbook is supplemented with a detailed subject index, and lists of references that are cited in the text and in figures. Useful are also lists of units and conversions, and abbreviations frequently used. In future editions, however, the experimental data in figures and tables—now presented with original units and dimensions—would be more comparable if recalculated and unified according to SI.

The excellent Larcher's textbook—in newly revised, updated German and English editions—may be recommended to every plant scientist as an up-to-date, well comprehensible source of recent information on plant functioning in the surroundings of the recent World.

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