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BOOK REVIEW

GUTSCHICK, V. P.: A FUNCTIONAL BIOLOGY OF CROP PLANTS. – Timber Press, Portland 1987. 230 pp., US \$ 39.95.

Most of the recent advances in the plant physiological ecology are based on the research of wild plants which ensure the long-term survival of the species and the genus. The book reviewed expands the “functional biology” viewpoint to crop plants, integrating the physiology, morphology, phenology and ecology.

The matter is divided into five chapters. In the introductory one “Functional Biology and Plant Strategies” the author explains the principles of plant functional biology, summarizes the requirements of plants in their growth and functions, sums up adaptive strategies, calculates the costs and benefits, tries to quantify the risks and management, deals with effectiveness and limitations of strategic adaptations and enumerates additional strategic considerations for the biotic environment. The second chapter on “Mineral Nutrition” is devoted to essential elements in the ecosystem and their availability in soil, to physiological limitations of internal transport and use, to severe imbalances between nutrients, to toxicity of nonnutrients, mainly metals, to consequences of nutritional challenges and to costs and benefits of adaptive responses. The next chapter dealing with “Photosynthesis” briefly reviews the basic photosynthetic reactions, CO₂ and water exchange, CO₂ and photon transport in canopy, units and determinants of photosynthesis, with costs, benefits and challenges of energy and soil resources, consequences of challenges to photosynthesis, adaptive responses and their costs and benefits. The fourth chapter concerning “Water Relations” is again introduced by a short review of water in plant structure and function, continues with a brief review on water potential and terminology, water transport in soil, water uptake by roots, transport in plant, water consumption in photosynthesis and analyses of cost-benefit in water use. Drought, flooding and salinity stresses are dealt with from the viewpoint of challenges, consequences of challenges, costs and benefits of adaptive strategies. In the concluding chapter “Integrative Processes” new features in long-term coordination of all resource uses, plant reproduction, seed germination, morphogenesis and the control of biotic interactions are discussed. The volume is supplemented by lists of 479 references, 150 symbols and a voluminous (10 pages) Index.

The book is intended to advanced undergraduate and postgraduate students of plant physiology, genetics and breeding and to all those interested in the functional approach in general biology.