

Pessarakli, M.: **Handbook of Plant and Crop Stresses**. 2<sup>nd</sup> Ed. – Marcel Dekker, New York – Basel 1999. ISBN 0-8247-1948-4. 1 254 pp., USD 235.00.

As the Editor states in the Preface, this book has been almost completely rewritten, *i.e.* more than two-thirds of the material is new. The book contains 37 new and 19 updated chapters. The text has been prepared by a much broader scope of authors than the previous edition: 112 authors from 24 countries. Even if the largest number of authors works in the U.S., many scientists, especially from Europe and Asia, wrote individual chapters. 35 authors work in the U.S.A., 12 in India, 7 in Pakistan, 5 each in France, Germany, Slovakia, and Spain, 4 each in Australia, Bulgaria, England, and Israel, 3 each in the Czech Republic, Japan, and Singapore, 2 each in Italy, People Republic of China, and Russia, and finally 1 each in Canada, Colombia, Egypt, Hungary, New Zealand, Poland, and South Africa.

The 56 chapters are grouped according to the topic in 11 parts. These parts are: Soil salinity, sodicity, low/high pH, and soil nutrient deficiency problems (chapters 1-4). Plants, crops, and stressful conditions (chapters 5 and 6). Plant and crop responses under salt, drought, heat, temperature, light, and other stressful conditions (chapters 7-25). Plant and crop responses under pollution stress (chapters 26 and 27). Plant and crop responses under agrichemical stress conditions (chapters 28 and 29). Molecular biology and microbiological aspects of plant responses under salt, drought, and other environmental stress conditions (chapters 30-37). Genetic factors and plant/crop stress (chapter 38). Examples of empirical investigations of specific plants and crops grown under salt, drought, and other environmental stress conditions (chapters 39-46). Future promises: plant and crop adaptation and cultivation under stressful conditions (chapters 47-51). Climatic changes, elevated carbon dioxide, and plant/crop responses (chapters 52-55). Beneficial aspects of stress (chapter 56). This list shows that all existing types of stress and their effects on plants and crops are included.

Twelve chapters (13, 14, 20, 21, 22, 23, 24, 25, 45, 46, 54, and 55) are focused on direct effects in photosynthesis. They show changes in synthesis, contents and functions of chlorophylls (Chl) and carotenoids (Car, often of the xanthophyll cycle), proteins, and lipids, in chloroplast ultrastructure, photosystem 1 and 2 (PS2)

composition and activity, photoinhibition, photooxidative stress, contents and activities of carboxylation and anti-oxidative enzymes, net photosynthetic rate ( $P_N$ ), photorespiration, growth analysis characteristics, stomata dimensions and density and stomatal conductance ( $g_s$ ), water use efficiency, *etc.* These characteristics are also shown and discussed in about 15 further chapters: Chl synthesis and content in chapters 11, 26, 29, and 47, Car and xanthophyll cycle in chapters 10 and 29, Chl fluorescence in chapter 29, chemical composition of thylakoids in chapters 10 and 36, chloroplast ultrastructure in chapters 10, 19, and 29, active oxygen species and chloroplast anti-oxidative enzymes in chapters 10 and 37, photosynthetic gene expression in chapter 36,  $P_N$  in chapters 26, 29, 40, 47, 52, and 53, gross photosynthetic rate in chapter 47, photorespiration in chapters 40 and 52, carboxylation enzymes in chapters 47 and 52,  $C_4$  metabolism and its enzymes in chapters 40 and 42, ATPases in chapter 40, stomata dimensions in chapter 26,  $g_s$  in chapters 11, 35, 38, and 52, photosynthate sequestering in chapter 40, growth analysis in chapters 5 and 26, *etc.*

Chapters of part VIII deal with individual crop plants, *e.g.* *Ajuga reptans* (chapter 46), *Citrus* (chapter 45), *Medicago sativa* (chapter 41), *Phaseolus vulgaris* (chapter 39), or *Zea mays* (chapter 40). Even algae are included in some cases (chapter 20). Growth of plants, yield, and oxidative stress are dealt with in many chapters.

Almost all chapters contain large lists of references, with maximum number in chapter 38 (536 references). Unfortunately, in this case (and in chapter 54) only short references (without title of the respective paper) are presented. In a few chapters only a selection of references to existing papers is given (*e.g.* in chapter only 46 mainly Russian papers are cited). The Editor did not unify symbols used in individual chapters. The reader can find even some non-standard terms (photosynthesates). The book is supplemented with a very detailed subject index. No index of authors or plant scientific names is added.

The book contains material interesting for scientists, teachers, and students interested in plant physiology and plant production. Stresses are at present so important that this book should be present in every library dealing with this research topic.

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