Book Reviews

CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. 3 Volume Set. Umberto Quattrocchi. 2006. CRC Press, Taylor and Francis Group, 6000 Broken Sound Parkway, NW, Suite 300, Boca Raton, FL 33487-2742. 2,383 p. \$650.00, hard cover, ISBN 0-8493-1303-1

This publication is in three volumes, which list grasses alphabetically by genus according to currently accepted names with authors. Volume I covers genera A–D; Volume II covers E–O, and Volume III covers P–Z and has a general bibliography. After the generic names, earlier names with authors or other nomenclature may be listed. The volumes include about 800 generic names and thousands of species of grasses. Each entry of genus or species includes previous scientific names with authors, geographical distribution, morphological information, distinctive characteristics, habitat, and common names (in one or more languages) and other variants in nomenclature for species. Each entry for genus also includes subfamily, tribe, and subtribe. A diverse bibliography, based on print and electronic media, notes from where the information was derived for each genus or species. Main and secondary uses for the species are mentioned if known. Some of the entries are extensive and include details that readers must study carefully to identify and to understand the information that is given.

The author has degrees in political science and in medicine. He retired as a medical doctor to pursue studies in botany and in politics. He is a member of the Royal Horticultural Society, the Botanical Society of America, and a Fellow of the Linnean Society. He is the author of *CRC World Dictionary of Plant Names*, a four-volume publication on vascular plants and a winner of the Hanbury Botanical Garden Award. He is a professor of political science. He is a prolific writer of other books and articles in plant science and politics.

The *CRC World Dictionary of Grasses* provides an in-depth study of a single family of plants and, hence, give a more comprehensive study of grasses than the previous dictionary. Likely, grasses were chosen for a detailed presentation because of the size of the plant group, their worldwide distribution, and their importance in world economy. In preparing this book, the author dealt with thousands of plant names in many languages. His abilities as a botanist and linguist helped him with this task. Scientific names of plants have been formed over centuries, and many different generic and species names have been used for the same plants. This book helps people to know and understand the background of past and current scientific names.

This book provides easy and good access to data on grasses. It will be a resource to people involved in botany, horticulture, or agronomy and will enrich their understanding of the

history, culture, and bibliography of plants. The three volumes are expensive and will occupy considerable shelf space, problems that will deter collecting this book. Libraries will want to acquire copies for centralized reference use. I consult my books on plant taxonomy every day and do not want to go to the library every day or to search the Internet for information about plant species. People who work with extensively grasses should consider personal financing or obtaining grants to purchase copies of this book for everyday use.

ALLEN V. BARKER
University of Massachusetts
Amherst, Massachusetts

Enhancing the Efficiency of Nitrogen Utilization in Plants. Sham S. Goyal, Rudolph Tischner, and Amarjit Basra, editors. 2005. Food Products Press, 10 Alice Street, Binghamton, NY 13904-1580. 489 p. incl. index. \$59.95, softback. ISBN-13: 978-1-56022-141-8

This book has a foreword and twelve chapters written by experts in crop science. The foreword discusses increases in world population and increases in earth land surface under cropland and managed grazing. The author notes the importance of nitrogen fertilizers, new crop varieties, and improved soil-management practices in the increased agricultural use of land and in the enhancement of yields of crops needed to feed the world population in the past, present, and future. He writes, however, that use of nitrogen fertilizers has contributed to perturbations in the global nitrogen balance. The foreword introduces the remaining text very well. The chapters of the book are divided into three sections that review literature on (1) Physiology and Adaptive Mechanisms, (2) Molecular Genetics, and (3) Applied Aspects.

The section on physiology and adaptive mechanisms with five chapters deals with nitrogen uptake, transport, and assimilation. The first chapter in this section addresses plant growth responses to changes in the supply of nitrate and ammonium relative to uptake and transport of these ions. The literature on characteristics of roots and nitrogen uptake is reviewed in the second chapter with attention given to longevity, architecture, and uptake kinetics of roots and to the importance of evaluating these properties collectively rather than individually. Nitrate uptake and reduction are reviewed in a third chapter. For uptake, attention is drawn to nitrate sensing and to nitrate carriers. The focus on nitrate reduction is on relations between nitrogen and carbon and on structural and molecular approaches to understanding reduction. Environmental effects on nitrate uptake are reviewed. In the next chapter, nitrogen use at the leaf and canopy level is discussed in relation to the effects of interception and use of radiation with regards to leaf expansion, senescence, and photosynthesis. Genetic variability in

nitrogen use efficiency is discussed with attention to cellular metabolism and whole-plant complexities. The last chapter in this section deals with the interactions between nitrogen and carbon in plants and addresses topics of regulation of nitrogen and carbon metabolism and signaling pathways in plants.

The two chapters on molecular genetics discuss applications of molecular markers in breeding for nitrogen-use efficiency and agronomic and molecular aspects for improving this efficiency. Marker-assisted selection is reviewed for its potentials in cases where phenotypic screening is difficult or expensive and its time saving value. The agronomic approach integrates uptake and metabolic processes, signaling, and whole-plant physiology with nitrogen-use efficiency.

The applied aspects of nitrogen-use efficiency are about half of the text of the book. This section has five chapters, which review nitrogen fertilization, rhizobial inoculants, nitrogen nutrition of horticultural crops, nitrogen nutrition and irrigation, and modeling to study fate of nitrogen in cropping systems. Nitrogen fertilization is discussed with respect to intensive and sustainable farming systems and addresses global food demands and fertilization, the nitrogen cycle, precision management of nitrogen in agriculture, and related topics. In the chapter on rhizobial inoculants, history, legume-rhizobium interactions, selection of rhizobia, breeding of legumes, and use of management practices to maximize the interactions and fixation of nitrogen are presented. Nitrogen nutrition of horticultural crops confronts the problems of using concepts of soil fertility developed for agronomic crops with the production of a diversity of horticultural crops in fields, containers, and hydroponics and also the problems associated with the reporting of regimes of fertilization and nutrition of horticultural crops. The chapter on irrigation emphasizes practices to improve recovery and to minimize losses of nitrogen from fields. Management of irrigation and application of nitrogen is discussed. The last chapter in this section summarizes the use of simulation models in the assessment of the fate and transport of nitrogen in various production systems and how these models can be used in the development of best management practices to maximize nitrogen-use efficiency.

The book gives good discussions of topics of current interest in increasing efficiency of nutrient use by plants. The documentation with references cited for each chapter allow for readers to have access to recently published literature on nitrogen-use efficiency by crops. This book was copublished as a volume of the *Journal of Crop Improvement* (vol. 15, no. 2, 2005). This journal may not be readily available in public libraries, and people who do research and teach in plant nutrition should consider buying this book for their personal libraries.

ALLEN V. BARKER
University of Massachusetts
Amherst, Massachusetts