

## Agricultural Salinity and Management

*Edited by Kenneth K. Tanji, American Society of Civil Engineers, 345 East 47th Street, New York, NY 10017. 1990. 619 p. \$96.00. ISBN 0-872-762-4.*

Salinity problems have challenged mankind for thousands of years and likely caused the collapse of some early civilizations. Today, salinity problems confront agriculture worldwide in arid and semiarid regions, and in spite of the fact that we know more than enough to prepare a book like this one on the subject, these problems threaten the closing of some irrigation districts. In a sense, minicivilizations that are supported by irrigation districts with severe salinity problems are threatened with collapse. Unfortunately, we learned much of what we know too late. Water rights were allocated and irrigation projects developed without sufficient attention given to the quality and quantity of drainage water that would result from the irrigation. New drainage water quality problems continue to be recognized and identified. In addition, nonagricultural needs for water are increasing, strong arguments are being developed favoring the use of more water for urban and wildlife use and less for irrigation, and the competition for high quality water is critical. Salinity problems could become more limiting as more water is used for other purposes and less for irrigation. Many important decisions lie ahead on this complex problem.

This hardcover book contains much of the available knowledge and developed management technology principles on soil salinity and drainage water quality. The book resulted from efforts of the Water Quality Technical Committee of the Irrigation Division of ASCE. It is comprised of 28 chapters and is the work of 49 contributing authors. The book contains little information that is not published elsewhere, but the editor and authors are to be commended for combining this large amount of information under one cover. As is the case with most scientific books compiled by an editor from many authors, this book contains considerable overlapping and repetition among the chapters. For example, some crop salt tolerance information appears in a half dozen or more chapters, and it all basically is from the same sources. Some chapters are written at a rather introductory level, whereas others assume that the reader has considerable background. In my opinion, some of the chapters could have been combined, a few deleted, and the messages could have been better delivered.

The book begins with a discussion of the nature of salinity and an overview of the diagnosis of salinity problems and

available control technology. Next, the chemistry of salt-affected soils and waters is discussed including trace element chemistry. Salinity effects on the soil and plant response to saline and sodic conditions follow. Field sampling and field and laboratory measurements are discussed in a couple of chapters. Salt tolerance is discussed from the viewpoints of genetic development of tolerant cultivars, root zone integration of salinity by plants, general salt tolerance ratings, on-farm practices to avoid salinity effects on yield, managing water of different qualities to lessen salt damage, and leaching and drainage to reduce salt effects on yield. Modeling approaches to the understanding and solving of salinity problems are presented. The book concludes with two chapters dealing with institution and legal constraints and environmental quality impacts and potential reconciliation through economic incentives. The final chapter asks and answers the question: Is irrigated agriculture sustainable?

Each chapter contains reference listings, some of them rather lengthy, making the book a reasonably good bibliography on the subject of agricultural salinity. However, many individual references are repeated numerous times, debatably requiring unnecessary printing space. A large number of references are listed 5 to 10 times. Unfortunately, there are some important references absent from this book. These absences denote some biases in the information presented. Two obvious biases are a geographic bias to work done in California and a bias toward work on chloride systems, which represent the simplest systems, and which are common to that geographic area. More emphasis should have been placed on carbonate and sulfate systems and on soils high in cations other than sodium.

Researchers, and those seeking an understanding of agricultural salinity problems, will find this book invaluable. Unfortunately, the field practitioner will likely become discouraged trying to find much of real help in the book to solve immediate problems. Those field practitioners and many others have cried for a *Revised Handbook 60*, which this book certainly is not. The book could, however, be the basic information source from which a more simplified field practitioner's guide outlining specific steps to follow for diagnosing and managing salinity problems could be prepared. Perhaps that should be a next step by an ASCE committee or some other group.—DAVID L. CARTER, *USDA-Agricultural Research Service, 3793 North 3600 East, Kimberly, ID 83341.*