opportunity to view the problems and progress being made toward a more sustainable agriculture in countries from four continents. It should be of most interest to practicing agronomists, because much of the information presented presupposes a working knowledge of the field.—ERIC PAL

Sustainable Agricultural Systems


Intense concern exists among farmers, rural dwellers, and urban consumers on the negative environmental aspects and lack of profitability of modern agricultural systems. Sustainable agriculture, an agricultural system that relies more on on-farm resources and less on purchased inputs, may provide solutions to the current environmental and economic problems associated with modern agricultural systems. This hardcover book, one of many that have recently addressed the issues of sustainable agriculture, contains the proceedings of an International Conference on Sustainable Agricultural Systems held at Ohio State University, Columbus, OH, in September 1988.

The book contains 40 chapters that are divided into six sections. Section I, An Overview of Sustainable Agriculture, discusses sustainable agriculture in a historical and global context. Because of the nature of the topic, the six chapters in this section are sometimes redundant. Nevertheless, this section provides an excellent framework for the topic of sustainable agriculture. Section II, The Components of Sustainable Agricultural Systems, discusses topics such as crop rotations, tillage practices, nutrient management, and pest management. Most chapters are excellent scientific treatises replete with new and recent research, future research needs, and a comprehensive list of references. Section III, The Importance of Integration in Sustainable Farming Systems, and Section IV, Sustainable Agricultural Systems in the Tropics, should be read by all researchers involved in sustainable agriculture. Section V, Policy Development for the Low-input Sustainable Agriculture Program, emphasizes the economic and sociological aspects of sustainable agriculture. The Role of Economics in Achieving Low-Input Farming Systems is an exceptionally well-written chapter and should be read by agronomists, agricultural economists, and university and government administrators. Section VI, Improved Ecological Impacts of Sustainable Agriculture, is a collection of broad ecological topics encompassing both agricultural and human ecology. The chapter Sustainable Agriculture and Water Quality is an excellent scientific document on the impact of agriculture on water quality.

Sustainable Agricultural Systems is a comprehensive text that addresses all the issues of sustainable agriculture. Because of the scope of the subject matter, the book contains valuable information for agronomists, agricultural economists, rural sociologists, and administrators in academia, industry, and government agencies. Most of the contributors are experts in their respective subject matter, so this text should become a standard reference for sustainable agriculture.—W. J. COX, Dept. of Soil, Crop, and Atmospheric Sciences, Cornell Univ., Ithaca, NY 14853.

Soil Biochemistry, Volume 6


The 1980s witnessed some major refocusing of research emphases in soil biochemistry as a result of two major developments: the realization of the magnitude of environmental deterioration and the burgeoning advances in molecular biology. The former has resulted in a massive research effort to evaluate the efficacy and efficiency of biocatalytic remediation of contaminated soils and aquifers. The latter is having a profound impact on every facet of biology, including the development of disease-resistant crops, beneficial plant-microbe associations, and more effective plant pest pathogens. In step with these developments, Volume 6 in the Soil Biochemistry series dedicates a significant portion of its contents to developments in the transformation of contaminants in soils and documents the advent of biotechnology in soil biochemistry. Like preceding volumes, however, this book is very broad in scope.

This book is a compilation of 11 chapters contributed by an international group of authors. Chapter 3 offers an up-to-date account of advances in the anaerobic microbiological transformations of heterocyclic, aliphatic, and aromatic hydrocarbons citing field and laboratory comparisons. Chapter 9 is a review of the interactions of metals with microbes, soil minerals, and organic matter emphasizing the physiology and genetics of microbial metal redox cycling. Chapter 10 is a timely, well-written, and thoroughly referenced update of factors influencing radionuclide mobility in subsurface environments with emphasis on the synthesis and degradation of organic complexes. Chapter 2 is an exhaustive review of the mineral-catalyzed polymerization and depolymerization of humic materials highlighting the need for future research on the abiotic transformation of xenobiotic compounds. Chapter 1 is a well-synthesized review of clay-enzyme interactions providing a mechanistic explanation for seemingly contradictory results, and Chapter 8 deals with the origin and persistence of lipids in soils and their importance in aggregate stability. Chapter 6 offers a critical analysis of commonly employed methods for determining the (micro)biological activities of soils, and Chapter 7 considers the ecological significance of soil microbial biomass estimates. Chapter 4 deals with the difficult analytical aspects of measuring microbial cytokinin production in situ, and Chapter 5 discusses genetic approaches for studying mechanisms of plant disease suppression promoted by fluorescent pseudomonads. Finally, Chapter 11 deals with the occurrence and potential health implications of viruses in soil environments.

All the chapters are extensively referenced through 1988 with a more thorough review of the European literature in chapters by European authors. In clearly defining future research needs on the basis of what is currently known, there is an unevenness among the chapters. Some provide little more than a factual account of present knowledge, whereas others are more explicit in pointing out where the gaps in our present knowledge exist and where future research opportunities lie. Editorial oversights in several of the chapters detract from the quality of this volume with sometimes humorous (“...abiotic formation of human substances in...”, p. 51) and sometimes outlandish (“46.6 g RNA-N g⁻¹ of soil...”, p. 317) misprints. Because of the book's cost and its diversity of topics, it is unlikely to appear on many private bookshelves. It may, however, serve as a useful library reference for those scientists seeking up-to-date and comprehensive reviews of the topics covered.—WILLIAM F. GUERIN, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824-1323.

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