Land Application of Wastes: Volume I and II


These two books provide a comprehensive review of the state-of-the-art for land application of wastes as an alternative to conventional waste treatment. The books evolved from an educational program begun in 1974 by a multidisciplinary team at Cornell University supported by the U.S. Environmental Protection Agency (1974-1977) and the Army Corps of Engineers (1977-1978). The team has also developed supplementary tutorial material in the form of slides and tape modules that are available from Instructional Materials Service (Stone Hall, Cornell Univ., Ithaca, NY 14853). The subject matter in the two volumes is well organized in modular format. Each module deals with a specific topic and includes a summary and italicized statements which highlight the key points in the module and afford a rapid review of the material.

Volume I contains discussion of basic concepts in land application. The main thrust is site selection for a particular waste; hence, waste characteristics, soil properties, treatment systems, and vegetative cover form discussion topics for different modules. Design procedures, cost of land application systems, societal constraints, and legal aspects form additional modules. Finally, case studies of 14 existing land application systems are briefly reviewed and many others are cited.

While Volume I covers the background material for determining the suitability or limitations of a site for a particular waste, Volume II contains detailed discussions of the quantitative aspects of land application of wastes. Accumulations and transformations of nitrogen, phosphorus, toxic elements, and pathogens are adequately discussed in separate modules. Especially useful are the sample calculations of loading rates based upon current regulations or guidelines for metals potentially toxic to plants and animals and for other pollutants of surface and ground water. Discussions of crop selection and management practices in relation to land characteristics provide essential information for obtaining detailed design parameters for an application site. However, the module dealing with climate and waste storage is unduly lengthy. It contains numerous figures, tables, and computer programs detailing occupying almost one-third of Volume II.

The books are well referenced, and should be useful to students, design engineers, planners, and the scientific community interested in land application of municipal, industrial, and agricultural wastes as an alternative to conventional methods of waste treatment.—B. L. SAWINNEY, Department of Soil and Water, The Connecticut Agricultural Experiment Station, New Haven, CN 06504.

Agricultural Ecology. An Analysis of World Food Production Systems


The book, consisting of three parts and 27 chapters, integrates several areas of study, including the biological, agricultural, and social sciences, in an overall approach to the understanding of ecology in agriculture. This is a good text for undergraduate students in the multidisciplinary area of natural resources. It may also be useful for graduate students, because it seems to be the only available text in agronomic ecology.

The introduction clearly points out the changing face of agriculture and land use with the rapidly rising human population. The need for stewardship and strategy in agriculture in order to avoid disasters in the future is emphasized.

The chapter on the world food balance discusses the need to consider production systems in a coordinated fashion including subsistence, nonmechanized, and intensively mechanized systems. Little hope is held out for production increases through the use of new lands, while increased yields on existing lands has hardly kept pace with population growth in the less developed countries in recent years. Needs in education, nutrition, and distribution are pointed out.

Discussion of topics such as ecosystems, the evolution of agricultural systems, subsistence agriculture, and ecological aspects of intensive agriculture in Part I are well covered. In a general manner, this discussion sets the stage for Parts II and III.

Part II is a detailed coverage of agroecosystems with some well covered principles of many disciplines making up the agricultural sciences. Basic concepts on climate, soils, conservation, pest control, and management are included. Part II serves well as a general agriculture course for students in an interdisciplinary area.

Part III attempts to determine what agriculture will be in the future. By its predictive nature it asks several questions that are necessarily unanswered. Nonetheless, it does serve to stimulate thought, and to point out the need for constant dialogue, planning, and consideration of the multifaceted discipline term agricultural ecology.—TREVOR G. ARSCOTT, Professor, Department of Agronomy, Ohio State University, Columbus, OH 43210.


This book represents an ambitious effort on the part of the authors to cover a very complex and, as yet, not entirely understood subject: the major limitations to land application of wastes. The topics covered, after an elongated introduction, are land limiting constituents; fundamentals of plant-soil systems; soil hydraulics; phosphorus and sulfur; oil and grease; noxious organisms; acids, bases, and salts; anions; heavy metals; nitrogen; land treatment system design; pretreatment and plant control of wastes; and total system design.

This book is well referenced and chock full of interesting and useful information, both theoretical and practical in nature. Of all the areas covered, however, I thought that Chapter 3 "Fundamentals of Plant-Soil Systems" was the least fundamental. Much of the information contained in that particular chapter is very general and not at all up to date. A similar criticism can be made of Chapter 7 on phosphorus and sulfur. On the other hand, the sections on oil and grease, organics, and anions appeared to me to be much better. Chapter 4, by Wayne Nutter, a guest author, treats soil physical characteristics in a much more readable fashion than found in the rest of the book.

Perhaps the strongest criticism is the repetition that is found throughout the book. In countless cases, entire sentences are repeated a paragraph or two below the place in which they first appeared. In spite of such repetition, there are many points that are not made very well, rather having been written around and around. One further criticism can be leveled at the typographical, spelling, and grammatical errors which average one per page; but tend to pile up at the rate of four on one page and none for three pages, indicating occasional lapses in editing.

Finally, in spite of the deficiencies of the book as a whole, the fact that so much diverse information has been brought together in one place is a tribute to the persistence of the authors. Anyone who wishes to become acquainted with land treatment of waste systems will find it to be a valuable reference.—G. W. THOMAS, Agronomy Department, University of Kentucky, Lexington, KY 40546.