Herbicides: Physiology, Biochemistry, Ecology.
2nd Edition.


This two-volume treatise is a major revision of the first edition published as a single volume in 1964. In the intervening twelve years, there have been substantial increases in the number of herbicides—95 listed in the first edition and 156 in the second edition—and herbicide usage has become almost universal in crop production in the developed nations. A concurrent expansion of basic and applied herbicide research made necessary substantial additions of subject matter in this edition, as well as the inclusion of a number of topics not covered in the first edition. Subject matter coverage in this treatise is comprehensive. The morphological and physiological responses of plants to herbicides is thoroughly covered in ten chapters. Aspects of herbicide absorption, translocation, and metabolism by plants is detailed in three chapters. What is known of the mode of action of herbicides at the biochemical level is elucidated in discussions of herbicide effects on respiration, photosynthesis, intermediary metabolism, nucleic acid metabolism, and protein metabolism in the final four chapters of the first volume.

The second volume focuses attention on ecological and environmental effects of herbicides. Herbicide-soil interactions are discussed in terms of herbicide behavior in soils, herbicide degradation pathways, and herbicide effects on flora and fauna. Herbicidal selectivity, as determined by differences in uptake, translocation, metabolism, and internal plant factors, is thoroughly reviewed. The influence of important external factors of the environment, and herbicide formulation and application method also receive appropriate attention. Several new topics arise from public concern over potential hazards of extensive herbicide use. Detrimental and beneficial ecological effects and toxic hazards to humans and mammals are put in proper perspective. Potential for increasing the quality and yield of crops with low-stimulatory rates of herbicides is an added subject topic that points up the relationship of herbicides with the broad area of plant growth regulators. Included, also, is a discussion of analytical methods for the determination of herbicides which should be extremely useful to those who are searching for an appropriate analytical method for a specific herbicide. Both bioassay and chemical methods are reviewed.

This treatise provides students and scientists concerned with herbicides and their use with an information source of great value. The inclusion of a comprehensive index covering both volumes enhances the usefulness of the book as a reference source. The editor is to be commended for integrating a broad range of topics written by well-chosen authors so that little of what is now known concerning the effects of herbicides on the physiology and biochemistry of plants and on the environment has been omitted.—R. BEHRENS, Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN 55108.

Woodwastes Utilization and Disposal


This publication deals with collection, utilization, and disposal of wood-based materials which traditionally present waste disposal problems. Bark, leaves, and even wood present in municipal solid wastes are discussed as possible raw materials for production of various products, including energy. Very little new information is contained in this book. It is, in fact, a compilation of previously published work. Much of the volume is, in fact, a complete reproduction of several of the publications referenced. The book is well-arranged topically, guiding the reader in a logical, easy-to-follow format through different subject areas. While the index is complete, it does not allow quick referencing of topics. Sources of information for much of the material presented are, however, not carefully documented.

Chapters 1 and 3 of this publication are devoted to equipment used in the harvesting and gathering of wood residues. Some discussion of bark usage for ground cover is also included. Information presented is up-to-date and useful, particularly that in Chapter 3 dealing with specifications for evaluation of various types of chip-harvesting equipment. Listings of manufacturers of tree and wood waste processing equipment, as well as a partial list of contractors to municipal governments who own such equipment, are contained in this chapter.

Chapter 2, which addresses the subject of composting, is perhaps the most useful portion of this book. A rather complete coverage of this subject is presented, along with brief summaries of the experiences of several municipalities which have been involved with composting.

Chapters 5 and 6 are devoted to residues as an energy source. A summary of available information regarding heat values and chemical analyses of various woods is presented in Chapter 5, along with a few examples of mill and forest residue volumes generated in various areas of the U.S. This is followed in Chapter 6 by a brief discussion of various types of wood waste burning energy recovery systems and some performance data for these systems. These two chapters provide a good introduction to wood waste energy recovery systems and provide sufficient information to allow rough computations of volumes of heat which might be recovered from a given volume of residue.

The book, as evidenced by the topics covered, is primarily directed toward methods of dealing with urban wood wastes; it should be of interest to city planners or to businessmen located in metropolitan areas. As coverage of subjects is of a general nature, this book will be most useful to those with little prior knowledge who are seeking an introduction to the wood waste utilization area. —J. L. BOWYER, Department of Forest Products, University of Minnesota, St. Paul, MN 55108.

Pollution Control for Agriculture


This reasonably priced and well-written book has been prepared for use as a text for advanced undergraduate students and introductory graduate level students. In addition, however, the book could serve as a useful reference book for individuals seeking information on the scientific approach to waste management. The book would be more applicable for classes offered with an engineering emphasis on the processing and management of the agricultural waste than for classes taught with an emphasis on recycling through agricultural utilization. For individuals associated with an engineering curriculum, the book does provide an introduction into the use of waste material in agricultural operations, as well as describing the production and characterization of the waste material.

The chapters in the book are titled such that it is somewhat difficult to find a thread running through the table of contents, but each chapter is well written. For maximum use, additional references with respect to chemistry and biochemistry of waste management could have been added. Overall, the text is reasonably well cited, using the short numerical system. Discussion of waste recycling through agricultural operations and associated plant responses is rather weak.

The book is up to date and includes recent references. The presentation are well illustrated with figures and photographs, although, in some cases, the figures reflect the rather advanced scientific literature as opposed to textbook consideration. The emphasis throughout the text tends toward animal waste production, management, and utilization; however, all agricultural wastes are treated in the respective chapters. Some attention is also directed toward municipal sewage sludges and their treatment and utilization. Characterization data is discussed with considerable emphasis on carbon and nitrogen amounts; however, very few comments relate to trace element problems which may be associated with atmospheric deposition.

The author is to be commended for his overall scientific approach toward management of agricultural waste. Sound chemical and engineering principles are incorporated throughout the text and are used as a basis to discuss the management of agricultural waste. Abbreviations are used extensively in the text. The abbreviations are not accepted by those working in the field and would serve to acquaint one with current literature.

This reference and textbook will make a good contribution towards the literature, especially with respect to engineering principles of the management of agricultural waste products. The book will be much more useful in engineering, using the engineering approach towards agricultural waste management as opposed to the agricultural viewpoint.—VAN V. VOLK, Department of Soil Science, Oregon State University, Corvallis, OR 97331.