BOOK REVIEWS

Energy, Agriculture and Waste Management

This is a compilation of papers presented at the 1975 Agricultural Waste Conference, sponsored by Cornell University and the National Science Foundation, discussing the energy required in agriculture and waste management. Although these papers are individual contributions, each addresses one of three topics: (i) energy and food production, (ii) energy consumption for controlling wastes, and (iii) energy reclamation from agricultural wastes.

The first section, which consists of 10 papers, discusses the energy requirements for food production globally, statewide, or locally—for a given agricultural unit, i.e., a 100-cow dairy farm. Within this section, the reader can find extensive data on the energy requirements for various farm operations. Since much of the data are given on an energy basis, they are not dated like the economic figures.

The second section, energy consumption for controlling wastes, discusses the energy impact of pollution control and of various agricultural and municipal waste water treatment operations. The papers in the final section, which comprises about half the book, consider the potential for biogas production from agricultural wastes—some from the engineering aspects of biogas production, and others from the chemistry of anaerobic fermentation. This section includes an interesting two-paper series on protein production from animal wastes. Most of the papers consider biogas production from agricultural products concentrated in one place, like animal manure, rather than from those produced from plant residues scattered over the soil surface.

Most of the papers in this volume were authored by engineers and, in this reviewer's opinion, will be a valuable resource for agricultural, civil, and environmental engineers engaged in establishing energy budgets for various agricultural operations and waste management schemes. The figures and schematic diagrams are well-done and, unlike many other conference proceedings, this volume contains a valuable subject-matter index.

Thus, it should be a good library investment. — R. H. Dowdy, Soil Structure Research Laboratory, USDA-ARS, and University of Minnesota, St. Paul, MN 55108.

Managing Livestock Wastes

This international symposium was held in April 1975 at the University of Illinois and was attended by over 600 men and women from the USA and 18 foreign countries. The symposium was sponsored by ASAE and 18 other national and international organizations. The proceedings contain 180 papers ranging from literature reviews to research reports to detailed case histories of specific livestock waste management systems. Many of the timely topics are covered including health and economic impacts of livestock waste management, regulations affecting waste management, and utilization of waste for livestock feed and as a source of energy.

The book is very comprehensive with other papers included under systems for beef, dairy, poultry, and swine; utilization and transport of manure nutrients in soil; waste microbiology; gases and odors; waste handling and treatment including composting, lagooning, dehydrogenation, and reverse osmosis.

Individual papers are 3-5 pages in length and most are supported by adequate references. Photographs and illustrations are generally of good quality. The papers are up to date and represent aspects of livestock waste management from various regions in the U.S. and other countries.

This book will be a useful reference for agricultural engineers and others working in the area of livestock waste management, and should also be of interest to agricultural economists, agronomists, animal scientists, environmental planners, regulatory agencies, and livestock producers.

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Land Treatment and Disposal of Municipal and Industrial Wastewater
Edited by Robert L. Sink and Tatoki Asano. Ann Arbor Science Publishers Inc., P.O. Box 1425, Ann Arbor, MI 48106. 409 p. $20.

This book is an updated compilation of papers presented at a 1974 conference at Montana State University. It is typical of conference proceedings in general in that the quality ranges from poor to excellent. It is especially typical of the many recent conferences on land treatment in that the chapters quite often represent totally opposite points-of-view. Such conflicts are acceptable and even to be encouraged at conferences and symposia. One would hope for a reconciliation of these conflicts in a text that claims to be the complete reference for investigating, planning, and designing land treatment systems.

Most of the chapters on basic relationships and the engineering aspects are generally good quality. The chapters on industrial wastes, agricultural wastes, and on rapid infiltration systems are especially good. They present merits and constraints and provide specific criteria for planning and design and, therefore, closely approach the goals established for this book by its editors.

Chapter 11 on investigations and Chapter 12 on spray equipment are also very good. The former is somewhat conservative in its specified criteria for storage and application schedules even for a Montana climate. Such factors are the subject of investigations and not predetermined.

Chapter 5 on public health seems at times to offer misinterpretations. It cites a disease outbreak in swimmers in a river near an outfall as a potential example of the hazards of land treatment. In another case it claims a dysentery outbreak from pasture irrigation. In this case the outbreak was actually caused by a direct flow of sewage into a water well and not as a result of normal irrigation practice.

It would be difficult to find a more negative attitude toward land treatment than that expressed by Chapter 9. Much of the chapter is in direct conflict with the remainder of the book. It claims that dilution will solve surface water discharge problems. It then argues that waste water N and P applied to the land should both be limited to ≤ 1 mg/liter. Otherwise eutrophication may occur when the ground water under an application site emerges into a surface water.

Such a restriction cannot be supported by the body of facts available on N and P responses in land treatment. The position conflicts with the dilution logic presented for surface discharges in the same chapter. If dilution of ground water emerging into a surface water will not occur, then how can dilution be depended on for a direct discharge into the same surface water from an outfall pipe? If dilution is the answer to pollution, it should apply to all cases.

In summary, this book, despite updating and editing, remains a conference proceeding. It is valuable in that context and may be of use to those not previously exposed to land treatment concepts. Of equal value might be similar conference proceedings and the many documents now available from various state and federal agencies. The world still waits for the definitive textbook on planning and design of land treatment systems.—SHERWOOD C. REED, U. S. Army Corps of Engineers, Cold Regions Research & Engineering Laboratory, Hanover, NH 03455.

System Simulation in Water Resources

This book is a conference volume and follows the common practice of publishing papers presented at an international conference—in this case the proceedings of the international symposium on "Biosystems Simulation in Water Resources and Water Problems." The book is divided into six chapters each containing several papers. The chapters are:


The book contains papers on microhydrology models, such as profile studies of a soil-water-salt system, as well as papers on macrohydrology models like the quality of runoff water from a watershed. There are several good articles on modeling simultaneous flow of salt and water in soils which can be used as a reference for a lecture or a course on miscible displacement in unsaturated soils. Application of simulation techniques to systems involving biogeochemical parameters like BOD is relatively simple but interesting. Other models relate to the thermal pollution of industrial effluents, infiltration in multilayered systems, and effect of land use on stream salinity. There are also papers dealing in general with the identification of parameters for a model and role of models in planning and decision-making.

In these proceedings it is difficult to identify the various mathematical symbols from one paper to another. Also, sometimes it is difficult to follow