BOOK REVIEWS

Food, Fertilizer, and Agricultural Residues: Proceedings of the 1977 Cornell Agricultural Waste Management Conference


This book is the latest Proceedings of a series of annual conferences on current topics of agricultural waste management sponsored by the New York State College of Agricultural and Life Sciences, Cornell University, Ithaca, New York.

The theme of this conference was "Food, Fertilizer, and Agricultural Residues," and, thus, one would expect that these are the major topics to be covered. However, upon examination of the contents one finds 16 papers on sewage sludge and effluents, 10 papers on aspects of energy, 14 papers on animal waste management, and only 3 papers that deal with inorganic fertilizers. One must also stretch his imagination in relating this volume, in any significant way, to food or food production. More appropriate theme for the conference, in view of the papers presented, would have been "Sewage Sludge, Energy, and Animal Waste Management." Just because certain key words and phrases have already been used to describe earlier Proceedings in this series, their reuse should not be precluded if indeed they can accurately describe the contents of subsequent volumes.

In conferences and in published Proceedings such as this, the keynote address is perhaps the most important single paper because the role of the keynote speaker is to set the tone and philosophy for the entire conference. Unfortunately, the keynote paper, "Perspectives on Fertilizer Use, Residue Utilization, and Food Production" (Section One), is out of phase with much of the content of the conference. The perspectives that are offered often lack objectivity and merely reflect the biases of the author. Rather than proposing a more reasonable rationale for better utilization of organic residues on agricultural land for their nutrient value and for improvement in soil productivity, the author takes this opportunity to severely criticize the proponents of organic farming. In his argument the author leaves no "middle ground" and states unequivocally that the use of organic wastes, including livestock, human, and crop processing wastes, would contribute only 5 to 10% of the annual U.S. crop nitrogen requirement and therefore such wastes are economically, logistically, nutritionally, and practically insufficient and inadequate to be seriously considered in U.S. crop production systems. This particular viewpoint is one that might have been expressed some 20 years ago when our mounting piles of wastes were considered as something to be disposed of, but not as organic resources.

He further concludes that, "There is more promise in converting these sources of energy and protein by recycling, particularly through aquatic plants, into more acceptable and useful sources of food or feed. Recovering their energy by pyrolysis is wasteful; fermenting the material into methane is inefficient; and spreading it on crop land can lead to problems of toxicity in the edible products." Such generalities as expressed here are often dangerous and misleading since the actual method or process selected for energy conversion or utilization of various organic wastes will depend on the specific situation involved. Thus, it is not surprising that the forty or so papers that comprise the text of this volume are not attuned to the keynote paper.

Section Two of this volume deals with the subject of "Application of Wastewaters to Land," and provides useful information on land as a waste water treatment system. It also contains a very interesting paper that suggests ways and means of halting the one-way flow of nutrients from farms to cities.

Recycling of municipal sludges on land is the subject of Section Three and includes 11 papers which cover a range of topics such as federal "perspectives" and guidelines, economic analysis, impacts on crop yields and water quality, the value of different sludges as fertilizers, the impact of heavy metals on crops, and the potential use of sewage sludge solids in animal rations.

Section Four on "Nutrient Management" is comprised of five papers that deal with different management systems for increasing the efficiency of organic nitrogen sources (sewage sludges, animal wastes, and legumes) and commercial nitrogen fertilizers. The principal objectives here are to provide the greatest economic return while preventing environmental pollution. One paper that should be of particular interest to those concerned with nutrient management is entitled, "The Economic Trade-Offs of Commercial Nitrogen Fertilizers, Legumes, and Animal Wastes in Midwest Agriculture." "Methane Generation", the subject of Section Five, contains six papers on the anaerobic digestion of animal manures and food processing wastes to produce methane as a source of energy. The authors provide useful information on the current status and future potential of this technology.

Section Six entitled, "Energy Utilization and Production" consists of only four papers but they provide some of the most interesting information in the entire volume. Three of the papers consider the use of various crop residues (cotton gin waste, corn cobs, nutshells, and wheat straw) for energy derived from direct combustion, pyrolysis, and gasification. Details on residue collection, transportation, storage, combustion and energy conversion equipment, energy balances, and economic analysis are reported. The future prospects of this technology are rather exciting to speculate on.

The book concludes with Section Seven on "Animal Waste Management," a subject that has been extensively treated in earlier volumes. Nevertheless, the 14 papers on various aspects of disposal and utilization of different animal wastes provide a current status report on the subject.

Earlier Proceedings of this conference have always been widely consulted because their contents represent the latest developments in methods and technology for collecting, handling, processing, and utilizing organic wastes. Despite this reviewer's criticism, the 1977 Proceedings is no exception. It is highly recommended and should be widely acquired by scientists and engineers engaged in waste management research, extension workers, graduate students, and university libraries as well.—J. F. PARR, Microbiologist, Biological Waste Management and Soil Nitrogen Laboratory, Science and Education Administration, U.S. Department of Agriculture, Beltsville, MD 20705.