BOOK REVIEWS

one chapter on the cloning of cellulose biosynthetic genes from *Acetobacter xylinum*, and another one on the use of molecular probes to study the structure and function of callose and cellulose synthases.

Part II, which focuses on biodegradation, is edited by Paul Weimer and contains 12 well-organized chapters. The chapter that reviews methods for measuring cellulose biodegradation, together with the following chapter on the effect of cellulose structure on enzymatic hydrolysis, summarize important information from the chemical and engineering literature that is often not readily accessible to biologists. Other chapters cover cellulose degradation by both mesophilic and thermophilic anaerobes as well as aerobes, and describe fungal, bacterial, and plant cellulases. There is a well-written comprehensive chapter on cellulose decomposition in the ruminant, and another chapter on the role of cellulose degradation in reptile nutrition. There is also one nice chapter on molecular cloning of cellulase genes. However, the general area of cloning, characterization, molecular organization, and regulation of the cellulase genes in aerobic and anaerobic bacterial, and fungal systems did not receive as much attention as warranted considering the extensive amount of work in these fields over the last 10 years. Similarly, considering the amount of information available and its ecological and practical significance, a chapter on cellulose digestion in the termite gut would have been a useful addition to this otherwise good book. A well-organized chapter on the practical applications of lignocellulose biodegradation research would also have been a valuable addition to this book. However, there may have been constraints imposed on the total length of this book, which restricted the selection of material the editors were able to include.

In general, this is a well-written book that belongs in the libraries of most universities and on the shelves of most lignocellulose researchers; however, the book is rather expensive for use in most classroom situations. The book will also be useful for microbial ecologists, physiologists, and agricultural scientists as an important information resource on the biosynthesis and biodegradation of cellulose. --ELIS M. OWENS and C.A. REDDY, Department of Microbiology, Michigan State University, East Lansing, MI 48824.

In Chapters 7 and 8 the authors argue, effectively, that enhanced food production rather than farming methods is the important cause of nitrate leakage. Here comparisons are drawn between arable farming with fertilizer nitrogen systems and “grassland” or “grazing” systems. Discussions of losses from manures and sewage sludges provides insights related to their use.

Conflicts between social goals, food production and environmental change, seem inevitable (Chapter 9). Historical occurrences of large nitrate concentrations are noted. The authors close with a presentation of procedures for decreasing nitrate leaching from soil (Chapter 10).

The text is well-written and well-organized. It is conveniently on the literature to describe the factors affecting the movement and leaching of nitrates in soils and waters, with reference to agricultural (both cropping and livestock) production. Extracts and tables are superior in content and are used very thoughtfully. Many tables contain general data useful for setting a reference stage. Examples are the relative incidence of cancer associated with nitrates and the global distribution of N. Figure form varies but is mostly good. Much of the data cited was gathered in the USA, but the authors have drawn on a wide variety of sources.

The contributions of the authors are well-meshed and the vocabulary is pleasantly uniform throughout the text. Chapters 1 and 9 most closely meet the authors’ implied goal of addressing a broad audience. They are suitable for a first-year college freshman level of education (USA). Chapters 2 to 5 are better suited for advanced undergraduates and Chapters 6, 7, 8, and 10 are best suited for postgraduates. This book is a natural companion text for soil science, ecological economics, and environmental earth science courses.

The bibliography contains 132 references (68% of which is in the USA) and it is followed by a 6-page index.

Farming, Fertilizers and the Nitrate Problem


This book is an unabashed and effective defense of agriculture’s use of nitrogenous fertilizers. The Preface notes public concerns about nitrates and the casual conclusion that fertilizer use is a major problem in surface water contamination, which is followed by well-written and balanced chapters. Each chapter is well referenced and contains good summaries (including figures). The authors bring an impressive blend of knowledge in agriculture, ecology, environmental science, economics, and public health to the discussion. They review the data and make good arguments that contradict some generally held views about the role of fertilizers in surface water contamination. They conclude that the use of fertilizer nitrogen is important to agriculture and that there is no easy solution for reducing nitrates in surface water. The book is a comprehensive, well-written, and balanced defense of agriculture’s role in the use of fertilizers, and is recommended for all readers interested in the effects of agriculture on surface water contamination.

Economic Models of Agricultural Land Conservation and Environmental Improvements


I am not certain why this text was published. It seems that the goal of the text is to bring together several studies that have been previously published in greater detail. There are no new additions to the literature. The book is edited by Earl O. Heady, and it is followed by a well-organized index. The chapters are written for general audiences, and develop the vocabulary and concepts used in later chapters. The authors continue with a clear and candid discussion of problems involved with measuring productivity, and the data will surprise many readers. In Chapter 2, they review the data and make good arguments that contradict some generally held views about the role of fertilizers in surface water contamination. They conclude that the use of fertilizer nitrogen is important to agriculture and that there is no easy solution for reducing nitrates in surface water. The book is a comprehensive, well-written, and balanced defense of agriculture’s role in the use of fertilizers, and is recommended for all readers interested in the effects of agriculture on surface water contamination.