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## BOOK REVIEWS

*Soil Microbiology and Biochemistry, Second Edition.* By E. A. Paul and F. E. Clark. San Diego: Academic Press (1996), pp. 340, £29.50. ISBN 0-12-546806.

This book is aimed at advanced undergraduates, but will prove useful for post-graduates because of its in-depth analysis of the subject area. There is a logical progression of chapter subjects: historical perspectives; soil as a habitat; methods for studying soil micro-organisms; components of the biota; occurrence and distribution; carbon cycling and soil organic matter; residue decomposition; nitrogen cycling (three chapters); mycorrhizal relationships; commercialization of soil organisms; phosphorus transformations; sulphur transformations; and microbial transformations of metals. The rapid development of new techniques since the first edition has been thoroughly covered – including molecular biological techniques, Biolog assays, and fatty-acid analyses. The references are current and not biased towards North American data. The book contains some frustrating mistakes. For example, in Fig. 4.7 nematodes are shown as being smaller than protozoa, rather than the other way round; Fig. 5.2 would be more useful with a proper legend to show water-filled/air-filled pores; Fig. 5.3 does not show what the text says it should and there are no answers to questions posed on reaction kinetics. These are minor criticisms of a work which encompasses the complexity of soil biology and developing techniques in a comprehensive, valuable and readable form.

Bryan Griffiths

*Costs, Benefits, and Farmer Adoption of Agroforestry: Project Experience in Central America and the Caribbean.* Edited by D. Current, E. Lutz and S. Scherr. Washington DC: The World Bank† (1995), pp. 212, US\$13.95. ISBN 0-2813-3482-X.

The focus of this book is on the costs and benefits that accrue to farmers in adopting various agroforestry practices. Various authors review twenty-one projects in eight countries (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Haiti and the Dominican Republic). Two chapters precede the country papers, the first providing some overall synthesis, and the second, an ‘Economic Analysis of Agroforestry Systems: the Farmers’ Perspective’, providing methodological details.

The book probably provides the first large-scale study of farm-level profitability and consequent adoption of agroforestry in the tropics. It was found that many agroforestry systems are profitable at real discount rates of 20% or higher. Intercropping was more profitable than woodlots and was found to diversify income, to add value per unit of land, to improve cash flow and to cause only limited yield losses of the main crop. Farmers were willing to invest in rehabilitating their land where systems also produced products or income. Women frequently made the decision as whether or not to adopt agroforestry. Lack of land title did not seem to be a significant constraint to adoption. *De facto* property rights were, however, important for farmers to feel secure.

†Pricing of publications by the World Bank. The World Bank has agreements with sole distributors in most countries. The prices quoted in US\$ are for the USA. For UK prices it is necessary to consult the UK agent, Microinfo Ltd, PO Box 3, Alton, Hants, UK.

Differences in the ways authors have presented their conclusions make country comparisons somewhat difficult. However, this study does represent a landmark in modern agroforestry and is strongly recommended reading for all involved in agroforestry.

Roger R. B. Leakey

*Biodiversity and Agricultural Intensification – Partners for Development and Conservation. Environmentally Sustainable Development Studies and Monographs Series No. 11.* Edited by J. P. Srivastava, N. J. H. Smith and D. A. Forno. Washington, DC: The World Bank (1996), pp. 128, US\$10.95. ISBN 0-8213-3759-9.

Many agricultural development projects have been designed and implemented without due consideration of their impact on the environment, especially biodiversity. This useful book stems from discussions within the World Bank on how to better harmonize agricultural development with the need to safeguard natural habitats and integrity of ecosystems. The editors, with the help of eighteen co-authors, have assembled eight chapters that focus on the following core issue: how agriculture can be intensified while enhancing biodiversity. They have identified three underpinning themes. The first is that biodiversity conservation is essential to make agricultural development more sustainable. Second, agriculture must be intensified in an environmentally friendly manner to reduce pressure on remaining habitats for wild plants and animals. Third, it will be easier to conserve and better use biodiversity if its value is more widely appreciated. The chapters include discussions on the importance of biodiversity, policy considerations (intellectual property rights, ownership, trade agreements), the impact of land-use systems, livestock systems, and an interesting historical case study on agricultural development in Iowa. The book concludes with an explanation of the World Bank's agricultural portfolio and biodiversity, and a comprehensive strategy to help policymakers reconcile the task of preserving biodiversity while increasing agricultural productivity.

J. E. Jackson

*Statistical Methods for Plant Variety Evaluation.* Edited by R. A. Kempton and P. N. Fox. London: Chapman and Hall (1997), pp. 191, £55.00. ISBN 0-412-54750-3

This is a well-edited multi-author book and the title defines the contents; it really is about the variety trials so widely used by plant breeders and about their design, execution and analysis. All chapters have points of interest and most plant breeders will want to read some (though not all) with care. I thought that the chapters on field plot techniques, on designs, on unreplicated trials and on series of trials would probably be especially valuable. Besides these topics, data management, spatial analysis and interference are also fairly well covered. Most of the models (sometimes fairly complex) adopted are linear, and relevant computer programs (so necessary nowadays!) get frequent mention. The authors are all statisticians, so plant breeding *per se* gets little mention and an overwhelming concentration on cereals is apparent.

I found that three important topics, though known to at least some statisticians, were ignored or nearly so. First, the knowledge that extremes are 'stretched' by errors and that therefore the 'best' means need 'shrinkage' goes unmentioned. Second, the fact that trials are trials which are merely assumed to predict the agricultural reality, not proved to do so, is also ignored. Third, trials are, in effect, all yield trials; but good decisions must take in other economic characters. I believe that statisticians could help here more than they do in practice. Perhaps a later edition will attack these matters?

N. W. Simmonds

*Seedborne Diseases and their Control: Principles and Practice.* By R. B. Maude. Wallingford, UK: CAB INTERNATIONAL (1996), pp. 280, £40.00. ISBN 0-85198-922-5.

This book is written by an acknowledged expert on seedborne diseases who has spent a life-time career on research on this topic. It is written from the viewpoint of a plant pathologist with an emphasis on the control of disease by cultural, chemical and other means.

The first five chapters deal with the biology of pathogens carried in, or on, seeds covering infection, transmission, survival and longevity, understanding of which is essential for the formulation of effective control measures. Although dealing mainly with fungal pathogens, viruses and bacteria are not ignored. The next three chapters are concerned with control of pathogens by wholly or partially excluding them from seed crops by quarantine, certified seed production schemes and cultural methods, and by eradicating or reducing inoculum by chemical and physical means. A final chapter deals with methods of detection using traditional and modern molecular techniques. Each chapter is comprehensive in its coverage and contains many references to research results. More than one thousand references are listed at the end of the book which makes it an important source of information.

The author has produced an authoritative book of value to the seed specialist and research scientist and one which will provide a bench mark for future progress in the area of control and detection of seedborne pathogens.

D. A. Perry

Readers may be interested to know about the following publications received but not reviewed because of their limited relevance to the majority of readers of *Experimental Agriculture*.

*Sustainable Settlement in the Brazilian Amazon.* By Anna Liza Orória de Almeida and Joao S. Campari. Oxford: Oxford University Press (for the World Bank) (1995), pp. 189, US\$32.95. ISBN 0-19-521104-9.

*Enabling the Safe Use of Biotechnology: Principles and Practice. (Environmentally Sustainable Development Studies and Monographs Series No. 10).* Edited by John I. Doyle and Gabrielle Persley. Washington DC: The World Bank (1996), pp. 74, US\$7.95. ISBN 0-8213-3671-1.

*Quarantine Pests for Europe, Second Edition.* Edited by I. M. Smith, D. G. McNamara, P. R. Scott and M. Holderness. Wallingford, UK: CAB INTERNATIONAL (1996), pp. 1440, £125.00. ISBN 0-85199-1548.

*Illustrations of Quarantine Pests for Europe.* Edited by I. M. Smith and A. S. Roy. Wallingford, UK: CAB INTERNATIONAL (1996), pp. 230, £65.00. ISBN 0-85199-150-5.

*Technologies Relating to Participatory Forestry in Tropical and Sub-tropical Countries (World Bank Technical Paper No. 299).* By E. Tamale, N. Jones and I. Pswarayi-Riddinghough. Washington DC: The World Bank (1995), pp. 49, US\$7.95. ISBN 0-8213-3399-2.

*Environmental and Economic Issues in Forestry; Selected Case Studies in Asia. (World Bank Technical Paper No. 281).* Edited by S. Shan and A. Contreras-Homosilla. Washington DC: The World Bank (1995), pp. 132, US\$9.95. ISBN 0-8213-3233-3.