

text is comprehensive, and will be very useful to undergraduate and post-graduate students, and also researchers wanting information in other than their own areas. The book has a wide range of well-known contributors, and is well presented and well laid out, with many supportive clear figures and photographs. There are five subject areas: background, soil biota, concepts and interactions, biochemistry and biogeochemistry and human activities, dealt with over 18 chapters. These include new chapters on bioremediation, soil molecular biology, biodiversity, climate change, physiology and ecology, complementing the previous, updated, chapters. These provide a comprehensive text that covers the subject of soil ecology in an holistic fashion, in sufficient depth for all levels of students and researchers. Topics covered range, for example, from carbon, nitrogen and other biogeochemical cycling via indigenous spatial variations to the management of organisms and processes.

These chapters provide excellent, contemporary information over the vast range of different disciplines involved in this subject, and each ends with a reasonably comprehensive bibliography that provides a good starting point for those wanting further information on the subject areas.

This book is recommended to both those new to, and those established in, the many disciplines involved in soil ecology.

Ron Wheatley

*Fertilizer Use in African Agriculture. Lessons Learned and Good Practice Guidelines.* By M. Morris, V. A. Kelley, R. J. Kopicki and D. Byerlee. Washington, DC: The World Bank (2007), pp. 144, £11.50 (paperback). ISBN 9-780821-368800. doi:10.1017/S0014479707005777

This report investigates the striking contrast between wide-spread food shortage and rather low fertilizer use with respect to crop yields in sub-Saharan Africa. The average input of eight kg/ha of mineral plant nutrients is only 10 % of that in South Asia. There are many reasons for this lamentable situation and the authors commendably guide the reader through the somewhat confusing maze of national fertilizer policies.

Generally overestimated are natural obstacles like degraded soils or low rainfall. The main causes are low profitability and that fertilizers alone are hardly sufficient for the wider goal of overall development. Nevertheless, fertilization being essential for rural development, it should be enhanced by demand-pull approaches (make cropping more profitable and less risky for the farmer), supported by supply-push approaches like cheap and easily obtainable fertilizers. The politically popular *fertilizer subsidies* are generally disappointing and should be replaced by market-smart grants or by institutional reforms. Fertilizer policy must fit into the countries' overall development plans. The attached tool kit (on CD) offers an interactive guide for creation and evaluation of fertilizer promotion programmes.

Some critical remarks: the term 'nutrients' and the efficiency parameters should be better explained and the confusing double-use of N and P avoided. The promised Guidelines do not refer to fertilization, as some readers may assume (see *FAO Fertilizer Bulletin* 16, 2006). Finally, one might add that a large part of 'African' fertilizer is applied elsewhere for imported food. ('Town people', regrettably, care more for cheap food than for rural prosperity).

To sum up, the authors present a competent survey of African fertilizer use and corresponding development policy – for the benefit of all readers and decision makers.

Arnold Finck

*Biology of the Nitrogen Cycle.* Edited by H. Bothe, S. J. Ferguson and W. E. Newton. Amsterdam, The Netherlands: Elsevier (2007), pp. 427, £68.99. ISBN 0-444-52857-1. doi:10.1017/S0014479707005789

This book is born from a European Science Foundation funded programme on 'Denitrification in Agriculture, Air and Water Pollution' and has 26 contributed chapters covering denitrification, nitrogen fixation, general N cycle and applications. Usually I start to read such 'formulaic' books with more than a little dread. However, any such feeling I felt at the start of reading this book quickly disappeared. It is well produced, starting with good introductions on various fundamental aspects of denitrification up to useful case studies focusing on wetlands, arable soils and forest soils. Overall the chapters are well written with some notable highlights being 'The ecology of nitrifying bacteria' and 'Introduction of the biochemistry and molecular biology of denitrification'.

It deals with a big subject well. It can be read by undergraduate and postgraduate students alike, providing a very informative and useful introduction (and in some chapters a lot more) of the biology of the nitrogen