

BOOK REVIEWS

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Biology of Earthworms. Edited by A. Karaca. Heidelberg: Springer-Verlag (2010), pp. 316, £135.00. ISBN 978-3-642-14645-0.

This book has the same title as that written by Edwards and Lofty and published 39 years ago but that is where the similarity ends. The 1972 book comprehensively dealt with the subject using information at hand at that time, while the present book deals in depth with some of the more interesting and topical aspects of the biology of earthworms relevant to research that is now ongoing. The fact that this book does not cover absolutely all aspects of earthworm biology is a reflection of how our knowledge has increased over the intervening years.

This book has 18 chapters written by specialists from throughout the world. There are chapters giving up-to-date information on the usual topics of earthworm reproduction, anatomy, the interaction of earthworms and agriculture and their usefulness in remediation and soil structure. However, there are also chapters on less recognized aspects of earthworm biology, e.g. antimicrobial vermipeptides, the earthworm immune system, biocontrol of soil-borne plant fungal diseases, use of earthworms as bioindicators of soil quality, and their role in organic farming systems and molecular genetics. These new aspects of earthworm biology, which have not been covered in previous text books published in the 1990s, make fascinating reading and contribute to us now having a better understanding of the role earthworms play in the soil ecosystem. This book is not for the general public but will appeal to graduates and research workers. Hopefully a paperback version will follow soon.

Brian Boag

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Soil Microbiology and Sustainable Crop Production. Edited by G. R. Dixon and E. L. Tilson. Heidelberg : Springer (2010), pp. 435, £135.00. ISBN 978-90-481-9478-0.

This is an excellent report on current knowledge of the many complex interactions that occur between microorganisms and crops in soils. Possibilities for future progress in increasing global crop production, using environmentally benign and beneficial means are also discussed intensely.

The book starts with a report on the fragility of world food production and the challenges faced in this vital area, particularly in the maintenance of soil health and the development of sustainable systems. Other topics covered include the sheer immense diversity present in soil microbial communities, which contain a large proportion of the world's biodiversity, much of which is yet to be defined. Microbial habitats and functional responses to system inputs, in nutrient cycling and the multitude of other functions vital to a sustainable biosphere are described. A fascinating chapter on the beneficial intimate associations between plants and microbes also presents many intriguing examples of biocontrol between microbes. Then the more frequently acknowledged phenomenon of pathogenicity, with its impacts, costs and controls is discussed in great detail.

An intriguing area, the impact of land-use practices on soil microbes, which is infrequently discussed, is introduced. Included are the effects of plants and plant breeding on microbial dynamics, with ideas on the possible potential for system management. Similarly the vast complexity of possible responsive interactions of soils to climate change is investigated.

This book is highly recommended to all those who are interested and involved in this fascinating area, from final year students to research leaders and consultants in all the environmental sciences.

R. E. Wheatley

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Principles of Soil Chemistry. 4th edition. Edited by K. H. Tan. Boca Raton, FL, USA: CRC Press (2011), pp. 362, £63.99. ISBN 978-1-4398-1392-8.

This is the latest edition of a text first published in 1982. Since 1982 much more information about soils has become available and there are marked changes in how we use this information. There have also been major developments in the analytical facilities available and associated increases in the volume and precision of the data obtained. The relative ease with which we are now able to gather data makes it ever more important that the basic principles of the nature of the materials and the processes in which they participate are understood.

The book has 12 chapters, beginning with an overview of the development of soil chemistry. From Chapter 2, there is a wealth of information which should prove sufficient for anyone with a reasonably good scientific background to understand some of the complexities of the soil system, focusing on the nature of the constituents, their interactions and the processes operating within it. Whilst in places there may be rather too much detail for some, the basic information is presented in a clear and concise manner and should provide a good starting point for the student soil scientist. The book includes all the basic material to be expected in a book on soil chemistry. It is written in a clear and concise manner and makes cross-reference between sections to help the reader; it also has a detailed index which is essential in a book of this nature. This is not a book you would read from cover to cover, but it will be useful to have on the shelf to pick up when you wish to seek information about soil chemistry.

Stephen Nortcliff

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Genetics and Improvement of Barley Malt Quality. Edited by G. Zhang and C. Li. Hangzhou and Heidelberg: Zhejiang University Press and Springer (2010), pp. 296, £171.00. ISBN 978-7-308-06382-1 and ISBN 978-3-642-01278-5.

This book seeks to review the latest developments in the understanding of the genetics of malting barley by using acknowledged experts to identify the key developments in their fields. Unfortunately, it reads like nine separate reviews with little attempt to connect them, which is a shame as some are very good. The book omits, however, any treatment of malting as a system and connection to the end-user. Malting quality is treated as a series of additive effects whereas it is a balance between competing processes where the aim should be to produce just enough enzyme at the right time, not to maximize its production. There are many varieties that have satisfied the criteria discussed in this book but failed to make any market impact, which partly reflects conservatism in malting but also highlights laboratory performance, often based on <1000 grains, as a poor predictor of industrial performance when applied to billions of grains. Chapter 9 touches upon the diversity of the malting market with some conflicting objectives that depend upon the exact end product, and this should have been extended to the problems faced in industrial malting and the quality aspects required to meet the different brewing markets. The authors were under the impression that their figures would be printed in colour whereas they are all in black and white and so their impact is diminished. The copy editing is poor with many spelling and factual mistakes, which again decreases the impact. In summary, the book is an update of previous reviews and worth purchasing if you do not already have one of those.

W. T. B. Thomas