*Land Use and Soil Resources*. Edited by A. K. Braimoh and P. L. G. Vlek. Dordrecht: Springer (2008), pp. 253. £84.50. ISBN-978-1-4020-6777-8. doi:10.1017/S0014479709007674

Eminent specialists with worldwide experience have collaborated in producing 10 diverse but inter-related chapters, with many references. In considering soil quality, productivity and derived environmental services, some writers are constrained by assuming that land degradation is caused by soil erosion. But what happens if we posit that erosion is a consequence of soil degradation, not its primary cause? Some incline towards soils as basically geomorphic entities forming at the rate of rock-weathering; others incline towards soils as biological entities being formed and re-formed from the top downwards through biotic transformations of organic matter. Some imply hope that increased efforts in soil and water conservation can prevent further land degradation. But it becomes apparent that many current problems with economically maintaining productivity require improvements in the biological dynamics of soil as a rooting medium.

The book shows flashes of an altered paradigm, in which more resilient plant production, more reliable river flows, net increase of soil carbon, improved productive potentials, self-recuperation of soil structure, greater efficiency in use of water, plant nutrients and energy, can be integrated. This is shown by matured examples of conservation agriculture. The four-way interactions between the biological, physical, chemical and hydrological components of soil productivity underpin both 'sustainability' and 'top-down soil-formation' and indicate the reliance of macro-scale improvements in productivity and livelihoods on micro-scale biotic activities.

It is unfortunate that the price of this interesting book will likely preclude many outside the academic world whose thinking and outlook would be stimulated as much by its implications as by its writings.

T. F. Shaxson

*New Light on a Hidden Treasure*. Rome: FAO (2009), pp. 136, US$45.00. ISBN 978-92-5-106142-8. doi:10.1017/S0014479709007686

The United Nations declared 2008 as the International Year of the Potato (IYP) in order to seek to strengthen the global potato industry and to be of particular value to developing countries in recognition of the potential of potato for them. This 'end-of-year review' sets out the rationale for the IYP's objectives and how they were implemented. It includes 10 FAO factsheets on the potato and briefly summarizes recent FAO statistics of world potato production and consumption highlighting the increasingly important role of potato in the developing world, a crop capable of producing a higher yield of nutritional food per unit area in a shorter period than the major grain crops. The potato's history and current situation in 52 major producing countries is profiled. The Director-General of the International Potato Centre (CIP) and other experts provide their perspectives, albeit briefly, on the potato's capacity to feed the poor, its origins, possible effects of climate change and progress towards sequencing the potato genome. Whether it will achieve its stated objectives or not this book provides a record of the IYP and is a compendium of numerous facts and figures of possible interest to readers seeking information on global food issues. Crop specialists may find it lacks substance but it could raise awareness and stimulate further investigation into some of the issues and areas briefly touched on. Unfortunately there are no references nor any suggestions for further reading to provide more substantive insights into the biology, origins, agronomy and economic importance of this extremely important crop.

G. R. Mackay

*Microbial Biotechnology in Horticulture. Volume 3*. Edited by R. C. Ray and O. P. Ward. Enfield, NH, USA: Science Publishers (2008), pp. 374, £47.60. ISBN 978-1-57808-520-0. doi:10.1017/S0014479709007698

This is an interesting book describing a wide range of applications and end-uses of microbial technology to agricultural and horticultural products from diverse locations. The technologies are described in the context of crop biology and social and economic considerations. Many of these technologies are applied at a local artisan level and have probably not before been exposed to comparison with the more well-known industrially applied fermentations. The depth of scientific description for each technology is variable and relates more to the level of knowledge rather than any shortcoming of the authors. The book examines liquid and solid-state fermentations for the production of wine and beverages from tropical and sub-tropical fruit, the processing of coffee and cocoa, the production and uses of microbial pectinases, edible and pharmaceutical mushrooms

and single cell protein. It also examines in a very timely manner the potential of solid-state fermentation of horticultural waste for the production of microbial inoculants, bioactive compounds, enzymes and biofuels. The final chapter summarizes the current commercial application of these technologies and looks at future prospects, some speculative. This book is largely well written and it is aimed at the non-specialist. Each chapter provides an overview and gateway to enable the reader to gain an understanding of the subject area. Some of the chapters lack details of current practice and describe technologies more aspirational than real. Personally I would have enjoyed more recognition of the need to develop these technologies in conjunction with the regulatory environment (environmental and pharmaceutical).

Kerry Burton

*Quantifying and Understanding Plant Nitrogen Uptake for Systems Modeling*. Edited by L. Ma, L. R. Ahuja and T. W. Bruulsema. Boca Raton, FL, USA: Taylor & Francis Group, (2008), pp. 312, US$149.95. ISBN 978–1-4200–5295-4. doi:10.1017/S0014479709007704

Modern agriculture is an exact science, with numerous models developed to best manage crops. Most plants are limited in growth by nitrogen, but this can be eliminated with fertilization. However, how much should be applied to maximize crop yield but minimize wasted cost, energy expenditure and environmental damage is somewhat of an inexact science.

Ma *et al*. have compiled the latest developments in modeling plant nitrogen uptake. Through 13 chapters the contributing authors cover topics from the rhizosphere and roots to mycorrhizae and Michaelis-Menten kinetics. Each chapter is straight to the point and focuses on a different model and crop, which is useful as an introduction to each model as well as insightful into specific crop behaviour. A good overview of model structure is provided for each model, and most are tested against data.

The book is, however, put together a bit piece-meal, – the selection of models and crops seems random at times, and there is no unified, robust model tested against all of the data presented in the chapters. There is redundancy in the chapter introductions (justification of why plant nitrogen uptake is important). Many of the models are empirically designed for one specific crop. Still other models are too complex to parameterize or simply not believable.

Nonetheless, for anyone interested in modeling plant nitrogen uptake, this should be the first source to go to for a solid overview of quantifying and understanding plant nitrogen uptake for systems modeling.

Joshua B. Fisher

*Rice Improvement in the Genomics Era*. Edited by S. K. Data. Boca Raton, Fl, USA: CRC Press/Taylor and Francis Group (2008), pp. 481, US$169.95. ISBN 978-1-56022-952-0. doi:10.1017/S0014479709007716

The advent of genomics has unleashed a plethora of information on gene structure and function, thereby opening new opportunities for accelerated and more precise breeding. It is indeed a daunting task for any individual to attempt to present such information in a single book, especially for a crop that has received so much scientific attention such as rice. Nonetheless, this excellent book contains contributions from eminent scientists describing the applications of biotechnology and genomics to rice improvement, such as in breeding for abiotic stress tolerance, insect-and disease-resistance, as well as nutritionally dense rice (rice with elevated levels of iron, zinc and $\beta$-carotene in the endosperm). The first chapter is rightly assigned to the ground-breaking work in the complete sequencing of the rice genome and its potential applications in rice research. The book then details the tools and approaches deployed for gene expression studies using microarrays, haploid breeding, hybrid rice technology, molecular marker-assisted breeding and use of transgenic technology to introduce new gene combinations or to suppress or over-express certain proteins. The authors acknowledge that these new tools do not offer a panacea for rice breeders and that many challenges remain to be surmounted in order to exploit this new information in breeding for more complex traits or traits not presently known in the rice gene pool. The arguments against some of the new technologies such as transgenics are highlighted but several authors in the book provide strong evidence in support of the technologies.

Baboucarr Manneh