

*Efficiency of Soil and Fertilizer Phosphorus Use: Reconciling Changing Concepts of Soil Phosphorus Behaviour with Agronomic Information.* By J. K. Syers, A. E. Johnston and D. Curtin. Rome: Food and Agricultural Organization of the United Nations (2008), pp. 108, US\$49.00. ISBN 978-92-5-105929-6. doi:10.1017/S0014479708007138

This is a very readable book that contains a wealth of valuable information on the behaviour of phosphorus (P) in the soil, and its acquisition and utilization by crops. It will be of interest to agricultural scientists, extension workers, farmers and environmental managers.

The authors develop and explore the hypothesis that soil P is present in several inter-convertible pools that can buffer and maintain adequate phosphate (Pi) concentrations in the rhizosphere solution for root uptake and crop production. The replenishment of Pi in the soil solution arises from (1) desorption of Pi adsorbed to particulate matter, (2) solubilization of mineral salts and (3) conversion of organic matter to Pi. These processes occur at different rates, which are strongly dependent upon soil composition, environmental conditions and agronomic practice. The authors argue that, given sufficient time, most soil P sources can become available to crops and that, if these sources are P-replete, the use of P-fertilizers in crop production can be optimized by maintaining a 'critical' soil P concentration for a given soil type, climate and farming system through the addition of fertilizer P equal to crop P offtake plus P losses to the environment. In support of this hypothesis, the authors have produced an appendix containing detailed agricultural case studies from nine broadly defined agro-ecosystems that all illustrate equitable P balances and crop yields over a number of years. The authors conclude that the efficiency of soil and fertilizer P use can be improved greatly by appropriate management of the surface soil and its P content, as well as by optimizing the timing, placement and rates of P-fertilizer applications.

Philip J. White

*Essentials of Ecology. 3rd edition.* By C. R. Townsend, M. Begon and J. L. Harper. Oxford: Blackwell Publishing (2008), pp. 510, £29.99 (paperback). ISBN 978-1-4051-5658-5. doi:10.1017/S001447970800714X

This updated and modernized edition of *Essentials of Ecology* provides the scientific foundation necessary for students to understand fundamental ecological issues. The authors integrate new material alongside classic examples to outline clearly the basics of ecology from theoretical underlying principles to practical applications. The book is divided into four sections. The first covers basic statistical and methodological approaches, and the evolutionary processes that result in contemporary ecological patterns. Section two discusses how species' tolerance of environmental conditions and requirement for resources determine their ecological niche and geographical distribution across scales. Section three forms the main body of the text and introduces key ecological concepts to understand population processes, the organization of communities, the determinants of patterns in species richness, and the flux of energy and matter through ecosystems. The final section applies these concepts to current ecological issues including sustainability of food production in the face of increasing human population growth, pollution and its impact on ecosystem services, conservation of biodiversity and the threat of global climate change. Unanswered ecological questions are highlighted throughout the text, history boxes outline landmarks in the development of ecology as a scientific discipline, 'topical 'ECOncerns' boxes highlight ethical, social and political questions in ecology, quantitative boxes explain mathematical aspects, and review questions are included at the end of each chapter to stimulate discussion and debate. This broad and comprehensive coverage precludes in-depth analysis of any single topic, but it nevertheless provides a sound basis for new students in ecology.

Cathy Hawes

*Food, Energy, and Society. Third edition.* Edited by D. Pimentel and M. H. Pimentel. Boca Raton, FL, USA: CRC Press/Taylor and Francis Group (2008), pp. 380, £48.99. ISBN 978-1-4200-4667-0. doi:10.1017/S0014479708007151

A book to savour, some 380 pages, 35 black-and-white figures and 23 chapters, including references, written authoritatively on the most important issues facing the future of mankind. It uses cogent explanation rather than complex mathematical expressions, convoluted modelling techniques or arcane advanced physics. The breadth of coverage is remarkable, and includes natural and managed ecosystems, the development of societies, crops and livestock, aquatic systems, energy usage in production systems, environmental and economic costings, water

resources, erosion, conservation, transport, renewable energy, biomass, ethanol and biodiesel, conservation, and pests and diseases. The main authors and the other authors that joined them in eight of the chapters are to be congratulated for the crisply written text that has relatively little repetition between chapters, yet manages to demonstrate with commendable clarity the close interrelationship between food production, energy dependency, and the development of societies.

Some may find the partial reliance on the particular situation of the USA a minor distraction, but it is justified, nonetheless. Undoubtedly, the two weakest components of the book are firstly its brevity on new technologies and concepts, and this accounts for the somewhat disappointing final chapter entitled 'Summing Up: Options and Solutions' although its blunt analysis of future prospects is surely correct. Secondly, it is prone to 'political correctness', for example in dealing with pesticides, a particular interest of David Pimentel. Despite these downsides, the polymathic approach of this book succeeds in its aims. It enlightens and has great utility for strategic planning and teaching.

John R. Hillman

*Guide to Cultivated Plants*. By T. Elzebroek and K. Wind. Wallingford, UK: CAB International (2008), pp. 540, £95.00. ISBN 978-1-84593-356-2. doi:10.1017/S0014479708007163

This book is intended as 'a standard reference text for students, extension workers, farmers, horticulturalists. . .'. It does not cover ornamentals (except, oddly, *Ribes sanguineum*). Treatments comprise origin and history; botany; cultivars, uses and constituents; ecology and agronomy but not pests and diseases.

Ecology and agronomy go out-of-date slowly, if at all, but the authors have not entirely succeeded in keeping up-to-date with information on crop origins. Errors occur in some of the botanical descriptions. The fruit of quinoa is not a utricle; *Piper* flowers lack a corona; ergot is characterized by dark sclerotia, not sclerotinia; capsaicin is produced only in the placentas of *Capsicum* fruit, not the seeds. Descriptions are not always comparable: lemon seeds are described as polyembryonic but this feature is not mentioned for other citrus species. There are also many taxonomic errors. Even molecular systematists have not transferred *Carica* to the Acanthaceae. Few would divide hexaploid wheat into three species. If *Fagopyrum esculentum* really evolved from *Fallopia convolvulus*, this would be the only current example of a domesticated species originating from a different genus. The myrrh brought to the infant Jesus was gum resin of *Commiphora*, not the European herb *Myrrhis odorata*. Regrettably, statements are not referenced in the text. Finding the original source for any statement is the single bibliography is thus an almost insuperable task.

It may seem nit-picking to concentrate on errors in a wide-ranging and beautifully produced book, but surely a 'standard reference text' needs to be accurate above all.

Barbara Pickersgill

*Integrating New Technologies for Striga Control : Toward Ending the Witch-hunt*. Edited by G. Ejeta and J. Gressel. London: World Scientific Publishing (2007), pp. 356, £55.00. ISBN 978-981-270-708-6. doi:10.1017/S0014479708007175

*Striga* spp. are parasitic weeds that constitute serious production constraints to cereals and legumes in tropical semi-arid regions (mainly Africa). They are sometimes referred to as witchweeds due to their invisible but harmful underground life-cycle stages. Decades of research have resulted in an array of control approaches. However, each one applied as a single control technology will be incapable of providing durable control of this genetically diverse parasitic weed. There is consensus among scientists that more control options need to be explored and that clever integration of some of these technologies is needed to end this 'witch-hunt'.

This peer-reviewed anthology, resulting from a symposium organized by the editors (Professor Gebisa Ejeta, Purdue University and Professor Jonathan Gressel, Weizmann Institute of Science), provides an overview of the state-of-the-art in the understanding of *Striga*-host interactions and offers a suite of control technologies and ideas for their integration. The book is interesting for both its contents and approach. The editors have tried to emphasize the need to look into all options that might help fighting this menace, including more advanced scientific methods like genetic engineering. The book also discusses projected future distributions of *Striga* in the light of global climate change, the lack of integration of biological with social sciences in *Striga* research and the institutional constraints to research and development of integrated *Striga* control in Africa. Such a