methodologies for specific plant types (lower plants, rice, other monocots and dicots, respectively). The transformation protocols cover a range of organisms, including *Chlamydomonas reinhardtii*, the major monocot crops rice, wheat, barley and oil palm and dicots, including plum, grapevine, cotton, *Impatiens* and *Torenia*.

A further four sections encompass a range of associated technologies, approaches and example applications. These include protocols for selection of transformants, targeted gene silencing and mutation, molecular pharming (production of biopharmaceuticals) and a curious single chapter section on *Arabidopsis* field trials. It is a pity that a more extensive treatise on field trialling genetically modified crops was not included, as this is an on-going and topical area worthy of an update.

The layout of the chapters follows a well-tested formula for this Methods and Protocols series: a brief introduction, detailed materials and step by step methods sections, and perhaps uniquely, a notes section with hands-on tips, and a list of references which are adequate without being comprehensive. The protocols are easy to follow, usually contain all the critical detail and are therefore an effective laboratory guide.

This volume is a second edition and also follows on from a previous volume in the same series (Methods in Molecular Biology 478) targeted specifically at wheat, barley and oats, edited by H. D. Jones and P. R. Shewry and published in 2009. This current volume represents a useful companion volume with updates in some areas and many unique topics. It is a worthy purchase for any plant biotechnology laboratory.

Malcolm J. Hawkesford

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Invasive Alien Plants. An Ecological Appraisal for the Indian Subcontinent. Edited by J. R. Bhatt, J. S. Singh, S. P. Singh, R. S. Tripathi and R. K. Kohli. Wallingford, UK: CABI (2012), pp. 314, £95.00. ISBN 978-1-84593-907-6.

India is vulnerable to invasive species due to rapid development, the increased transport links and disturbance to the environment in many areas. The focus on India gives readers a chance to access case studies on a wide range of environments and topics.

The book comprises 24 chapters, arranged in five parts with some 41 contributors in total. Part I on Major Invasive Plants, includes *Parthenium*, *Lantana* and the marine algae *Kappaphycus*. These chapters describe the distribution, habitat, biology, ecology and control methods. Some chapters are detailed review articles, while others, such as those on *Anthemis* and *Potomogeton*, are based largely on original data and observation. The possible impact in future climates is considered, using *Chromolaena* as an example. Part II on Status, Mapping and Distribution describes the situation of selected invasive plant species in different regions. Subsequent parts are Environmental Impact and Risk Assessment, and Population, Dynamics and Utilization. Lastly, Part V covers Management and Legislation in case studies on *Lantana* management in Chandigarh and *Prosopis* in Gujarat, and these explore issues related to these alien species and some of the challenges facing management of these areas.

Readers looking for an overarching ecological appraisal of the subcontinent may be a little frustrated as authors took different approaches, some being very descriptive and others more analytical; most chapters are well referenced. Some of the text could have benefitted from more robust editorial attention but the oversights do not detract too greatly from the work. The book is well bound, with a good index, and it is likely to be a valuable resource for practitioners, managers and policy-makers alike.

David E. Johnson

Expl Agric. (2012), volume 48 (4), © *Cambridge University Press 2012*
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Phytohormones and Abiotic Stress in Plants. Edited by N. A. Khan, R. Nazar, N. Iqbal and N. A. Anjum. Berlin, Germany: Springer-Verlag (2012), pp. 306, £126.00. ISBN 978-3-642-25828-2.

Phytohormones play a critical role in the complex signalling pathways controlling plant responses to abiotic stresses. Recent research on stress responses has concentrated on molecular signalling mechanisms with rather

less effort devoted to hormones and the more physiological aspects. This edited volume aims to provide an up-to-date account of the roles played by phytohormones in the coordination of plant growth and development in response to stress, and to provide an insight into the complexity of the mechanisms involved in signal perception and transduction in response to abiotic stresses. The format includes a mix of chapters ranging from those outlining general aspects of phytohormone involvement in stress responses to individual chapters on some of the traditionally recognised major hormone classes (auxins, cytokinins, gibberellins and ethylene) and on less well-known compounds (nitric oxide, brassinosteroids, salicylic acid and jasmonic acid). Disappointingly, there is no chapter specifically focussing on what is probably the central hormone involved in plant stress responses (abscisic acid), though it is discussed in the text.

Overall, the articles bring together much useful information on phytohormone involvement in the signalling pathways in response to abiotic stresses, with a particularly useful chapter by Harrison on the cross talk between them, and some useful up-to-date information and references. There is little attempt to synthesise available information on overall stress responses that could make this an essential read for researchers or students. Therefore, I cannot see any individuals and few libraries wanting to purchase a copy at this price. For most topics covered, more useful reviews can be found in recent issues of *Annual Reviews* or relevant plant journals.

Hamlyn Jones

Expl Agric. (2012), volume 48 (4), © *Cambridge University Press 2012*
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Bioenergy for Sustainable Development in Africa. Edited by R. Janssen and D. Rutz. Heidelberg, Germany: Springer Science (2012), pp. 413, £117.00. ISBN: 978-94-007-2180-7.

This book addresses bioenergy opportunities and related risks for Africa in five parts: Biomass Production and Use; Biomass Technologies and Markets; Biomass Policies; Sustainability of Biomass Production and Use; Financing and Socio-Economic Issues. The interest in bioenergy has been driven primarily by initiatives on climate change to reduce Greenhouse Gas (GHG), to reduce dependency on fossil fuels and by potential for socio-economic development. At the same time, there is increasing concern with the wider implications of bioenergy production, particularly if grown at large scale, including pro-poor development, environmental sustainability, GHG emissions, land use changes and impact on food prices.

African countries have launched initiatives to establish regulatory policy frameworks for bioenergy to ensure environmentally, economically and socially sustainable production and use of traditional and modern bioenergy. There are regional and African Union level initiatives too. Specific activities in bioenergy sustainability certification as an essential component of the regulation of the bioenergy sector are also being performed in three countries and one region but these do not address the perceptions of communities and the risks of negative environmental and socio-economic effects.

The book highlights the crucial importance of carefully integrating polices for land use, agriculture and energy, and aligning them with policies for rural development, transport and finance; and that bioenergy development in African countries will only find its proper environmental context and agricultural scale if convergence with biodiversity, GHG emissions and water use policies is achieved. Two important aspects are not addressed: the important role of Conservation Agriculture in reducing energy requirement for bioenergy crop production and in lowering GHG emissions, and the need to use crop residues in sustainable soil health and production management.

Amir Kassam

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Crop Post-Harvest: Science and Technology – Perishables. Edited by D. Rees, G. Farrell and J. Orchard. Chichester, UK: Wiley-Blackwell (2012), pp. 451, £160.00. ISBN 978-0-632-05725-2.

This multi-authored book provides a comprehensive overview of many of the factors affecting the post-harvest quality of perishable fruits, vegetables and ornamentals. The book is the third volume in a series dedicated