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*Plant Tissue Culture. Techniques and Experiments.* Third edition. By R. H. Smith. Amsterdam: Academic Press (2013), pp. 188, £54.99. ISBN 978-012-415920-4.

This is the third edition of a book first published in 1996. It is interesting to note that the basic techniques of plant tissue culture have changed very little, but some of the applications have diversified in this time. The book is aimed at students, and as such contains some valuable material and well-described practical exercises. The section on the set-up of tissue culture laboratory is useful and the following chapters describe exercises in all the accepted aspects of plant tissue culture, concluding with a chapter on *Agrobacterium*-mediated transformation. The chapter contents are rather uneven however, and there is no real need in a slim volume aimed at student practical exercises for a lengthy review on plant tissue culture history with 200 references cited. The chapter outlines at the start of each chapter are simple and informative and clear headings make the chapters easy to follow. However, some chapters have questions embedded and some do not, and this creates an inconsistent tone. The Appendices on *Useful Measurements* and *Solution Preparation* would be of some value to a beginner, and the *Glossary* gives clear explanations of commonly used terms. The real problem with this volume is that, while informative and easy to read, it offers little new to an already very well-documented branch of plant science.

Stephen Millam

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*Agroecology and Strategies for Climate Change.* Edited by E. Lichtfouse. Heidelberg, Germany: Springer (2012), pp. 335, £135.00. ISBN 978-94-007-1904-0.

Don't be misled by the title – the book is no more about climate change than any volume about agricultural systems. It is an eclectic mixture of contributions from fascinating chapters such as that on a novel land–energy use indicator for energy crops through to a chapter that largely catalogues plant parasitic nematode diversity in pome stone and nut fruits, hardly central to either agroecology or climate change adaptation strategies. There are the usual introductory and historical chapters and a number of good individual contributions such as that on the rhizosphere. The term ‘sustainably-competitive agriculture’ is used in one chapter, causing some confusion with current common use of the term sustainable intensification. Issues of pollution from animal waste are addressed, as are biotechnology contributions such as transgenic crops. When it came to chapters comparing organic with conservation farming, or looking at water use efficiency, I was hoping for data to support the comparisons but there was very little. Surely, reviews are the opportunity to compare such data side-by-side and look for overall trends? Having said that, the chapter on water use efficiency was also another otherwise good resource chapter. Overall, however, there is no coherence to this book – it is an assembly of quite separate contributions from very different perspectives that happen to all be about some aspect of agriculture, not strictly even agroecology. You might buy this book for some individual chapters, but otherwise it is just one in a library series.

Adrian Newton

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*Principles of Plant Genetics and Breeding.* Second edition. By G. Acquaah. Chichester, UK: Wiley/Blackwell (2012), pp. 740, £42.50 (pb). ISBN 978-0-470-66475-9.

The second edition of this book follows the general format of the first in that it is composed of two parts. The first part describes the principles, strategies and technologies used in crop breeding in a thorough and readable manner and the second part gives case studies of breeding in selected crops. However, this is not just an update

of the first edition but is a thorough revision with some very significant additions to it, in particular a section on molecular breeding comprising six chapters describing molecular markers, mapping of genes, marker assisted selection, mutagenesis breeding, polyploidy in plant breeding and molecular genetic modifications and genome wide genetics. There is also the welcome addition in the section on breeding selected crops of chapters covering some horticultural crops (cucumber, tomato and roses), which gives more variety than in the first edition that largely focused on the major staple crops. The author has also included two very useful supplementary chapters, one giving an overview of plant cellular organisation and genetic structures and a chapter on common statistical methods in plant breeding. As in the first edition, there are 'industry highlights boxes' embedded in all of the chapters written by experts in their field. These really are highlights and give a great amount of additional information and significantly add to the value of the chapters. Each chapter ends with key references and a set of questions to assess the readers understanding. This is an excellent textbook for students and teachers of plant breeding.

David Pink

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*Plant Stress Physiology.* Edited by S. Shabala. Wallingford, UK: CABI (2012), pp. 318, £85.00. ISBN 9781845939953.

Understanding the responses of plant tissues to stress and the potential for manipulating these responses is of key importance to plant scientists, especially those involved in crop production and storage of fresh produce. This is particularly important in a world responding to the challenges of climate change. As the editor states in the Preface, recent advances in biochemical and molecular techniques mean that we can now start to understand responses to stress in terms of specific genes. This book seeks to provide an update on the recent progress in knowledge on aspects of plant perception, signalling and adaptation to a wide range of stresses, including drought, salinity, heat and cold soil pH extremes.

The book is arranged in a very clear and accessible format; with descriptive abstracts and clear sub-titles in each chapter. Within each topic the principles and current models are well explained and are illustrated very effectively by diagrams throughout. Up-to-date review of the literature has been provided. Although it is inevitable that a book of this type will start to go 'out-of-date' within a few years, due to the clarity of presentation it will be a very valuable resource for scientists and tertiary scientists for many years to come.

Deborah Rees

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*Carbon Sequestration in Agricultural Soils. A Multidisciplinary Approach to Innovative Methods.* Edited by A. Piccolo. Heidelberg, Germany: Springer (2012), pp. 307, £90.00. ISBN 978-3-642-23384-5.

Sequestering carbon as stable, soil organic matter (SOM) is considered a feasible strategy in the fight to reduce greenhouse gas emissions. The book opens with discussion of the structure of SOM and challenges the traditional macropolymeric structure of SOM with evidence for a self-assembled supra-molecular association of small molecules. With this new vision of the structure of SOM, the authors describe experiments conducted at four locations in Italy (MESCOSAGR\* project) to test the effects of various soil treatments in relation to the ability of soil to sequester carbon. The principal treatments were (a) a traditional approach involving the addition of mature compost to protect labile organic molecules from mineralization, and (b) a novel approach involving the addition of a biomimetic catalytic compound (a water-soluble iron porphyrin) to enhance photopolymerisation of SOM. The main parts of the book deal with the results of the MESCOSAGR project in which the two principle treatments and other treatments (e.g. minimum tillage) to sequester carbon at agricultural sites were explored. The effects of iron porphyrin catalysts on soil and root respiration are also described. The final chapter highlights the development of a new model to describe and predict carbon sequestration dynamics in agricultural soils using information from  $^{13}\text{C}$  NMR to assess soil carbon quality. The value of the book is not