introductions to the diversity, comparative biology, history of cultivation and social and economic importance of cereals, but the main body of the work concerns the technologies of storage, processing and production. It is aimed at teaching environments, each chapter concluding with a self-assessment exercise. Otherwise, its main appeal will be for those involved in practical handling and utilization of grain, although the depth of coverage may discourage general readership, while specialists may seek more restricted subject areas.

Another problem, for a single author, is the quality of coverage in areas outside his personal specialities. Here, those areas where the author is able to cite his own references convey his knowledge and enthusiasm, but other sections seem heavily reliant on published sources, with geographic, technical or scientific limitations not always appreciated. While grading of samples is well covered, classification, especially of wheat, receives limited attention, despite the biochemistry and genetics, underlying differences between hard and soft milling, being well understood. Additionally, European maltsters and brewers would take issue with diastatic activity as the most important malt attribute, which only applies when brewing, as in the USA, uses large quantities of starch-based adjuncts. Despite these limitations, however, the book is a significant achievement and, with regard to global deployment of cereals for human and animal nutrition, will prove an extensive and valuable source of information.

J. Stuart Swanston

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Controlled Atmosphere Storage of Fruits and Vegetables. 2nd edition. By A. K. Thomson. Wallingford, UK: CABI (2010), pp. 288, £85.00. ISBN 978-1-84593-646-4.

With the importance of international trade of fruit and vegetables, postharvest technologies capable of cutting waste and reducing energy consumption are of increasing interest. Controlled or modified atmosphere storage, the subject of this book, involves the manipulation of the storage atmosphere to slow down produce metabolism, maintain quality and hence extend storage life.

The strength of this book, a revised edition, is not so much in the explanation of the principles and technologies involved, but in the thorough coverage of available information. The author covers several aspects of the subject. For example while most of the book concentrates on science, the introduction provides a very interesting overview of the historical development of controlled atmosphere storage. In subsequent chapters the author supports the description of aspects of postharvest handling with a wealth of specific commodity information. The fact that fruit and vegetables vary so much in their behaviour often causes confusion for those handling them, making this a particularly important feature of this book. Chapter 9 provides a particularly detailed review of the recommendations for controlled atmosphere storage of an extensive range of crops. Having been written by someone with an understanding of the practical applications of postharvest technology in addition to research, the book provides interesting insights into why some technologies have been taken up commercially while others have not.

Altogether this book is an invaluable source of information, and an excellent reference book for professionals and researchers involved in postharvest technology of perishable food crops.

Debbie Rees

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Plant Cell Culture: Essential Methods. Edited by M. R. Davey and P. Anthony. Chichester, UK: John Wiley & Sons Ltd (2010), pp. 341, £60.00. ISBN 978-0-470-68648-5.

For anyone working in the area of plant tissue culture, micro-propagation or transformation this book is essential reading. Learn how to set up your own mutagenesis experiment, perform protoplast fusions or grow your own hairy root cultures. From comprehensive protocols that take you step-by-step through each experimental procedure to troubleshooting guides that pass on all the trade secrets, this is a treasure trove of facts. Key

research papers are highlighted along with historical publications in each area. Research has been done in a broad range of plant species so there is something of interest to everyone. When I finished reading it my mind was buzzing with new ideas to try out.

Jennifer Stephens

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Microbes for Legume Improvement. By M. S. Khan, A. Zaidi and J. Musarrat. New York: Springer (2010), pp. 534, £153.00. ISBN 978-3-211-99752-9.

This volume is interesting, but also frustrating. Its major strength is that the authors approach their topics from the point of view of developing countries, where various symbiotic and other microorganisms can be of greatest advantage. It is refreshing to see review chapters written by those less familiar to many in the developed world, revealing literature not easily available to some readers. The extent of information on tree legumes is also good – most such books concentrate on grain and forage species. The frustration lies in the considerable amount of repetition, both within and between chapters, with three on arbuscular mycorrhizas, three on plant growth promoting rhizobia and two on biofilms.

I enjoyed the historical approach on rhizobial taxonomy (Chapter 1). Chapter 2, discussing infection, erred in considering only root hair entry, even though it noted that *Aeschynomene* (crack entry infection) can be nodulated by rhizobia lacking *nod* ABC genes, essential for hair infection. Chapter 3 covers some of the same material better. Chapter 4 goes into proteomics and like its predecessors, groups nodules as either determinate or indeterminate, completely ignoring the variations within these groups. Of the mycorrhizal chapters, Chapter 10 is the most comprehensive. Chapter 14 on metal tolerance is useful and Chapter 15 on legume-microbial interactions in stressed environments is good. Major grain legumes (soybean, common bean, cowpea and groundnut (peanut)) are covered in Chapter 18, but other legumes better adapted to saline and dry environments (some noted in Chapter 14) are not covered. The final chapter (20) looks at the potential uses of nodulated legumes for management of plant diseases, but misses out successes such as the use of *Desmodium intortum* and other legumes to control *Striga* in Africa. An index would have been useful.

Janet Sprent

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Glyphosate Resistance in Crops and Weeds. Edited by V. K. Nandula. Hoboken NJ, USA: John Wiley & Sons (2010), pp. 321, £66.95. ISBN 978-0-470-41031-8.

The importance of glyphosate in weed management in farming is undeniable. The development of glyphosate-resistant (GR) crops plus widespread development of conservation tillage has greatly increased its use, in some cases to the virtual exclusion of alternative treatments. A consequence has been the increasing development of GR in weed species.

This book provides a very useful review for researchers into GR crops and weeds, as well as to those involved in education and extension, and decision-making in the approval of GM crops. It exemplifies the complexities and consequences of resistance development in general.

The known sources of target and non-target site resistance to glyphosate are reviewed by several authors, and detailed examples are given for key crop and weed species. Tellingly, one author suggests that we have not yet seen the full capacity of weed adaptation to glyphosate. The development of multi-herbicide resistant crops allowing a wider range of weed control is discussed but the consequences of such developments are perhaps overlooked.

The economic and husbandry consequences of GR crop and weed development are also reviewed. Modifying crop management, rotation and cultivation and increasing use of alternative herbicides with different modes