

BOOK REVIEWS

Biotechnology of Fruit and Nut Crops. Edited by R. E. Litz. Wallingford, UK: CABI Publishing (2005), pp. 723, £125.00. ISBN 0-85199-662-0. doi:10.1017/S0014479705213066

This weighty volume is more than a revision of the editor's previous book on this subject published in 1992; it is completely new, both in scope and depth of coverage. Several nut crops are now included, and some lesser known fruit crops have been added to a wide range of temperate and tropical species.

A general introduction sets the context in which the following chapters can be considered. Thereafter, each of the 22 chapters gives an introduction to a particular botanical family followed by sections on the commercially significant species within that family. Some of the family introductions seem rather perfunctory, but the crop sections are generally well written by recognized experts, and these sections largely represent the state of the art regarding biotechnology in each crop. In the book, biotechnology encompasses not only molecular genetics and transgenic biology, but also older technologies such as somatic hybridisation and *in vitro* mutagenesis, which remain significant for many woody crop species. There are also short reviews of plant breeding progress in each crop, underlining the links between biotechnology and breeding. As might be expected in a book of this nature, some sections and chapters provide more depth than others, but all contain some useful information. Extensive bibliographies are provided at the end of each crop section.

The editor is to be congratulated for bringing such a diverse array of crop species (and authors) together into a coherent whole. Researchers, including postgraduates, will find it an invaluable starting point for specific crops, although the fairly high cost will probably restrict it to libraries, especially given the fast-developing nature of this particular field.

Rex Brennan

Plant Development and Biotechnology. Edited by R. N. Trigiano and D. J. Gray. Boca Raton, USA: CRC Press (2005), pp. 358, £49.99. ISBN 0-8493-1614-6. doi:10.1017/S0014479705223062

This volume is a detailed and informative review, comprising 29 chapters written by leading workers in their field. The Introduction places the subject in a wider than usual context, emphasising physiological and evolutionary aspects before giving a concise summary of the contents. The format and structure of the volume is clear and well-designed, each chapter starts with a bullet point summary of the concepts which is useful to the general reader, and most chapters are well-referenced. Each chapter, as the editors themselves note, would make a self-contained lecture topic. The illustrations throughout could be sharper, but are generally informative. The methodologies described start at a basic level, but extend in complexity to cover a range of relevant scientific areas, encompassing basic tools such as plant anatomy through to molecular techniques. The chapter on the often-overlooked topic of experimental design is an example of the detailed approach taken in compiling this volume. More examples of the specific applications of each technology would have been valuable additions to the crop improvement section, but a worthwhile attempt to offer balanced arguments for GM crop production is included. The chapters on commercial laboratory production and entrepreneurship are very constructive additions to a book of this nature.

This is a highly readable volume, likely to be a valuable reference source to both students and established workers in the field of contemporary plant development and biotechnology.

Steve Millam

Flower Seeds: Biology and Technology. Edited by M. B. McDonald and F. Y. Kwong. Wallingford, UK: CABI Publishing (2004), pp. 372, £95.00. ISBN 0-85199-906-9. doi:10.1017/S0014479705233069

Flower production is now a significant component of agricultural incomes in several developed (e.g. Japan, the Netherlands, USA) and developing countries (e.g. Kenya). *Flower Seeds: Biology and Technology* is predominantly

a USA-centric text. Given the extent of the development of flower seed and seedling technology in the USA this is largely helpful and useful, but this limitation should be noted. The book succeeds admirably in its principal goal of collating information on flower seeds and flower seed technology – from the development of the flower seed and the bedding plant industry (including the emerging ‘wildflower seed industry’), through breeding, flowering, seed development production, seed dormancy and germination, to seed testing and seedling production.

There is a good use of colour plates in the book. Given the attractiveness of flowers this is perhaps not surprising. I particularly commend the chapters by Myer (seed development and structure), Stephenson and Mari (germination testing), and by Miller (tetrazolium testing) which provide superb integration of text, diagrams and colour plates. This text is no doubt an essential purchase for those involved in the flower and bedding plant industries. Serious students of amenity horticulture and garden design will also be interested. The book is also likely to be useful to those currently engaged in more traditional aspects of agriculture but who are considering diversification into flower and/or flower seed production.

Richard Ellis

Climate Change in Contrasting River Basins. Adaptation Strategies for Water, Food and the Environment. Edited by J. C. H. Aerts and P. Droogers. Wallingford, UK: CABI Publishing (2004), pp. 264, £55.00. ISBN 0-85199-835-6. doi:10.1017/S0014479705243065

This book contains an analysis of possible adaptation strategies responding to climate change effects on water resources management, food production and the environment, using a generic approach, the so-called Adaptation Methods for River basins (AMR).

Adaptation strategies for food security and environment preservation are explored in detail. Simulations are made using time frames and spatial scales considering six scenarios of population, and economic activity growth in seven river basins. These simulations have shown that water use efficiency and biomass production of plants are likely to increase, leading to increasing water demand. The potential of food production increase will rely on the availability of water resources and on sustainability of markets. Improvement of water management and farmers’ practices will be the most effective solution to mitigate extreme effects of climate change.

Eco-systems are considered as water users with specific requirements in the analysis. They will be strongly affected, some will disappear, others will change to adapt to temperature, water regime and sea level changes. Globally the pressure of human activities will increase on eco-systems, especially because of pollution and increased climate variability. Adaptation strategies are analysed using state and decision indicators, but because of the complexity of interactions, their effects are difficult to understand. Finally, non-climate driven changes may have the highest socio-economic consequences. For example, if agricultural areas are reduced by switching to higher value crops or higher yield potential areas.

In conclusion, the studies described in the book are very useful for understanding the consequences of water management policies and will help guide decision-makers to design adaptation strategies to climate change.

Bruno Molle

Environmental Impacts of Sugar Production. By O. Cheeseman. Wallingford, UK: CABI Publishing (2004), pp. 272, £55.00. ISBN 0-85199-981-6. doi:10.1017/S0014479705253061

The environmental impacts of agriculture are of increasing interest to policy makers and the public alike. This book provides information on the impacts of the cultivation and processing of both sugar cane and beet. It is an excellent summary of published information, but the reference lists highlights the main problems of such a publication, i.e. that some details of modern production are seldom published in the literature. For instance, published information on soil tares for beet production included in the book is very much out of date compared to factory realities. Whilst this lack of publication by industry may sometimes be the result of a desire of companies to keep information confidential, the main reason is that information from mature industries is seldom seen as worthy of publication. Perhaps this book will be a spur to some industries to publish more up-to-date information on their activities.

Whilst there are large differences in the various environmental impacts of sugar beet and cane, the book does not attempt to compare the two. Rather, the book is structured with the author providing a considered summary of the impacts of each system. Whilst this makes each section a reference in its own right, it does result in much repetition of facts in the different sections. Readers are left to make their own decision regarding

the comparisons and, unfortunately, this has already resulted in some biased press articles. However, the book is a very useful source of information for those interested in environmental impacts of agriculture.

Mike May

In Search of Sustainability. Edited by J. Goldie, B. Douglas and B. Furnass. Collingwood, Australia: CSIRO Publishing (2005), pp. 187, £15.50 (paperback). ISBN 0-643-09062-2.
doi:10.1017/S0014479705263068

This book is written by Australians for Australians. It is the outcome of a nine-month Internet conference 'In Search of Sustainability', involving a number of Australian thinkers and researchers. Following a face-to-face conference in Canberra in November 2003, a number of the speakers were invited to write chapters. The topics include health, inequality and conflict, the post-growth society, land use, water, climate change, sustainable energy, urban design, sustainable work and population. There is an introductory chapter on the need to change direction and a final chapter on achieving a sustainable future.

While there are many definitions of the term 'sustainability', the editors have taken it to refer to the capacity of human systems to provide for the full range of human concerns in the long term. They note, however, that the full ramifications of a sustainable society have not yet been seriously debated in Australia. Many of the chapters can be read outwith the Australian context and are of general interest. There is, for example, a useful discussion of the relationship between global terrorism and its connections to unsustainability. There is also a very general account of the balance between economic growth and sustainability. Non-Australian readers would benefit from a section outlining some of the basic facts about Australia. These might include a map, an indication of population changes, climate zones etc. Oddly, there is no discussion of the original relationship between the indigenous Australians and sustainability and what the present population might learn from this.

Carol Duffus

Irrigation and River Basin Management- Options for Governance and Institutions. Edited by M. Svendsen. Wallingford, UK: CABI Publishing in association with the International Water Management Institute (2005), pp. 258, £55.00. ISBN 0-85199-672-8. doi:10.1017/S0014479705273064

River basin management has a long, and sometimes difficult, history and this wide-ranging view of the current scene, presented by an international group of specialists, is most welcome. The book is derived from a workshop on 'Integrated Water Management in Water-stressed River Basins in Developing Countries' held at Loskop Dam in South Africa in October 2000. However, presentations at that workshop have been expanded, and new material added under the skilled editorship of Mark Svendsen. Six case study chapters, each illustrating different aspects of basin management, are preceded by an introduction and four thematic chapters, and followed by two concluding chapters. Twenty authors (of at least eight nationalities) have contributed, with significant inputs from staff members of the International Water Management Institute, of which Svendsen is a Fellow. Case studies cover the Naste System, Southwest France (chapter author: Tardieu); the Central Valley, California, USA (Svendsen); the Lema-Chapala Basin, Mexico (Wester, Scott and Burton); the Olifants Basin, South Africa (de Lange, Merrey, Levite and Svendsen); the Dong Nai Basin, Vietnam (Svendsen, Ringler and Nguyen Duy Son); and the Gediz River Basin, Turkey (Svendsen, Murray-Rust, Harmancioglu and Alpaslan). An overall case study chapter format assists comparisons. Thematic chapters include Information Needs in Basin Water Management (Burton and Molden) – a topic close to this reviewer's field hydrological heart – and Financing River Basin Organisations (Abernethy). As regional water management becomes ever more complex, with irrigation increasingly needing to justify its place within wider water demand patterns, this book can be recommended as a valuable guide to current thinking and practice.

Henry Gunston

Soil-Water. Solute Process Characterization. An Integrated Approach. Edited by J. Alvarez-Benedi and R. Munoz-Carpena. Boca Raton, USA: CRC Press (2005), pp. 778, £97.00. ISBN 1-5667-0657-2.
doi:10.1017/S0014479705283060

This book is advertised by CRC Press as a 'detailed cookbook and a useful, practical reference for students, practitioners and researchers'. The book is divided into six sections and has a total of 21 chapters. The book

deals with a very broad range of topics from detailed characterization of the soil at small scales, as in the case of hydraulic properties (Chapter 6) and also microbial processes (Chapter 15), to the problems of how to deal with large scale spatial variability. The book has strong coverage of issues related to solute transport. The strategy of dealing with both measurement and modelling in some depth is a strength of this book, and because of that it probably succeeds in its goal of being a reference. The breadth and depth of coverage is excellent and it is well written. I have some minor complaints because the section on the measurement of matrix potential, although well written, is not at the cutting edge. Water-filled tensiometers that can measure matrix potentials less than – 100 kPa are now commercially available. I also wonder if the title could have given a better indication of the contents: perhaps ‘Soil Water Physics: A reference book’? However, this is a really useful book that will be a valuable source of first reference in a soil physics laboratory.

W. Richard Whalley

Seed Fate: Predation, Dispersal and Seedling Establishment. Edited by P. M. Forget, J. E. Lambert, P. E. Hulme and S. B. Vander Wall. Wallingford, UK: CABI Publishing (2005), pp. 410, £75.00 ISBN 0-85199-806-2. doi:10.1017/S0014479705293067

Crop establishment is directly affected by both seed predation and seedling establishment. Consequently, the topic of this volume should be of relevance to both agriculture and forestry.

This book presents the outcome of a 2002 symposium that took place at the Smithsonian Tropical Research Institute in Panama City and includes 23 chapters written by 48 contributors. It is divided into three main topics, ‘Seed predation,’ ‘Primary dispersal’ and ‘Secondary dispersal’. Section one contains six chapters on pre- and post-dispersal predation, with topics ranging from Bruchid beetles to peccaries. Section two consists of ten chapters on primary seed dispersal, by agents such as primates and rodents. Surprisingly, wind dispersal is not included. Section three has six chapters on secondary dispersal, one of which is a helpful review of methods for following seed removal and secondary dispersal.

The main theme that runs through the whole volume is the dual role of many species as both seed predators and dispersers. However, one of the three key areas highlighted in the title, ‘Seedling Establishment’, is barely discussed, receiving at best, a cursory treatment in just a handful of chapters.

This book should appeal to conservationists/ ecologists interested in how human-induced changes in the abundance and behaviour of seed predators and dispersers may affect patterns of vegetation regeneration. However, it is a shame that the contribution of the most sensitive stages in a plant’s life-cycle, seed germination and seedling establishment, to seed fate, is rather neglected.

M. I. Daws

Site Specific Grasses and Herbs. Seed Production and Use for Restoration of Mountain Environments. By B. Krautzer, G. Peratoner and F. Bozzo. Rome: Food and Agriculture Organization of the United Nations (2004), pp. 111, US\$24.00. ISBN 92-5-105188-7. doi:10.1017/S0014479705303061

This book provides a detailed description of 25 different grasses and herbs which occur naturally in the middle and high zones of mountain environments, and their suitability for restoration of mountain areas. The book concentrates on the production of seeds of each species, with a description of the size and shape of the seeds, including any peculiar botanical characteristics, followed by a comprehensive description of their seed production agronomy. This includes details of sowing rate, optimal soil conditions, climate, cultivation, fertilization and weed control. Details of the likelihood of lodging, propensity to seed shattering and a description of the spread of ripening and ripening in relation to other species will be particularly useful for a seed producer contemplating growing any of these species. Each section concludes with a description of the most appropriate harvesting techniques for each species and the seed yields that can be achieved.

There are excellent tables at the end of the book where suitability of each species for different mountain environments, moisture requirements, tolerance of fertilization, cutting and trampling and nutritional value are summarized, as well as a bibliography of related references. The book is illustrated with beautiful drawings, with excellent photographs of seeds and of each species during flowering. It is written in a style that will make

it easy to read by its target audience of innovative farmers and seed producers. It will also be an ideal starting point for anyone looking for information on the appropriate species for mountain environments.

A. Marshall

Fodder Oats: a world overview. Edited by J. M. Suttie and S. G. Reynolds. FAO Plant Production and Protection Series No.33. Rome: Food and Agriculture Organization of the United Nations (2004), pp. 251, US \$42.00. ISBN 92-5-105243-3. doi:10.1017/S0014479705313068

Oats have become increasingly important as green and conserved fodder for feeding to dairy and other livestock in many temperate and sub-tropical areas too cold for maize or perennial pasture or in warmer climates where they can be grown in winter. Chapter 1 and part of Chapter 2 of this book describe the oat crop in general and emphasize important features of fodder oat utilization such as multiple cutting in smallholder systems. Chapter 2, a paper from an FAO-sponsored meeting in 2002, spurred the formation of the Fodder Oat Network. Chapters 3 to 11 are fascinating accounts of fodder oats in North and South America, the Magreb, the Himalayas, China, Japan, New Zealand and Australia and Europe. These chapters provide a wealth of information on the different ways that fodder oats are utilized and how well-adapted cultivars are being produced for barren areas in Kashmir and the plateaus of Tibet, for the dairy areas of New Zealand and for export of hay in Australia. Chapter 12 summarizes oat diseases and their control. Chapter 13 is a perspective for fodder oats, some conclusions of which are the needs for better integration with livestock producers and for the training of new plant breeders targeting improvements of oats for forage rather than grain.

In general, the book is well illustrated, though judging by the pictures from Bulgaria, those buying hay from co-operatives there may be getting a raw deal! It has 395 references. The editors, authors and FAO are to be highly commended for this publication.

John Valentine

Books currently under review

Wild and Sown Grasses. Profiles of a temperate species selection: ecology, biodiversity and use. By A. Peeters. Rome and Oxford: FAO and Blackwell Publishing (2004), pp. 311, US \$125.00. ISBN 92-5-105159-3 and ISBN 1-4051-0529-1.

Ginger. The Genus Zingiber. Edited by P. N. Ravindran and K. Nirmal Babu. Boca Raton, Florida, USA: CRC Press (2005), pp. 552, £74.99. ISBN 0-415-32468-8.

Organic Phosphorus in the Environment. Edited by B. L. Turner, E. Frossard and D. S. Baldwin. Wallingford, UK: CABI Publishing (2005), pp. 305, £75.00. ISBN 0-85199-822-4.

Handbook of Photosynthesis. 2nd Edition. Edited by M. Pessaraki. Boca Raton, Florida, USA: CRC Press (2005), pp. 928, US \$92.00. ISBN 0-82475-839-0.

DNA Fingerprinting in Plants. Principles, Methods and Applications. 2nd Edition. By K. Weising, H. Nybom, K. Wolff and G. Kahl. London: CRC Press (2005), pp. 444, £56.99 (p.b.). ISBN 0-8493-1488-7.

The Genetic Diversity of Cacao and its Utilization. By B. G. D. Bartley, Wallingford, UK: CABI Publishing (2005), pp. 341, £75.00. ISBN 0-85199-619-1.

Litchi and Longan. Botany, Production and Uses. Edited by C. M. Menzel and G. K. Waite. Wallingford, UK: CABI Publishing (2005), pp. 305. £75.00. ISBN 0-85199-696-5.

Readers may be interested to know about the following publications received but not reviewed because of their limited relevance to the majority of readers of *Experimental Agriculture*.

Telling Transgenic Technology Tales: Lessons from the Agricultural Biotechnology Support Project (ABSP) Experience. By C. Brenner. Ithaca, NY, USA: ISAAA (2004), pp. 80, no price quoted. ISBN 1-892-456-35-4.

Technical Guidelines for the Management of Field and in vitro Germplasm Collections By B. M. Reed, F. Engelmann, M. E. Dulloo and J. M. M. Engels. Rome : IPGRI (2004), pp. 105, no price quoted. ISBN 92-9043-640-9.