

BOOK REVIEWS

Science and the Garden. Edited by D. S. Ingram, D. Vince-Prue and P. J. Gregory. Oxford: Blackwell Science Ltd. (2002), pp. 290, £19.99 paperback. ISBN 0-632-05308-9. DOI: 10.1017/S0014479703211418

The Royal Horticultural Society is to be congratulated on producing a book that fills a very necessary gap in the horticultural field. It is well laid out, with clear illustrations and a consistent format. Although most chapters had different authors, style and presentation are uniform throughout. The care and attention that went into the writing, editing and proofreading shows in the quality of the finished product.

The book is aimed mainly at students, who should find it indispensable. The range of topics covered is very broad, encompassing all aspects of the science of horticulture from the botany, taxonomy, genetics and life-cycle of the plant, through every stage of husbandry to post-harvest storage. It includes soils, the environment and pest control. Each contributor puts across a wide range of sometimes-complicated scientific points in a very straightforward and digestible manner, linking them wherever possible to everyday gardening examples. Every chapter ends with a list of suggested further reading and there is a very comprehensive glossary.

Advisers, commercial growers and amateur gardeners will also find this an enjoyable and interesting read as well as a useful reference book on the science behind the practice of horticulture.

Harry M. Lawson

Mathematical Models of Crop Growth and Yield. By A. R. Overman and R. V. Scholtz III. New York: Marcel Dekker, Inc. (2002), pp. 344, \$150.00. ISBN 0-8247-0825-3. DOI: 10.1017/S0014479703221414

This is not a review of crop modelling but is an engineer's view summed up by FAPP (*For All Practical Purposes*). The authors unashamedly restricted the book to analytical models – their own. It is aimed primarily at advanced undergraduate and post-graduate teaching, with a third given over to exercises. Ideally, the book should be accompanied by a sound lecture course – explanations are succinct, the reasoning behind model selection brief, and the constraints on transporting them to new circumstances need more discussion. The book starts with the practical problem then introduces models that predict seasonal responses to fertilizers and growth in particular. The underlying theory comes in chapter four followed by an overview of pasture systems, reflecting the authors' main interests. Finally, chapter six presents statistical theory used in fitting models and parameter estimation. Models are skilfully chosen to be tractable and practical. This usually means linear models. However, nature is largely non-linear and elegant analytical solutions are rare. The book is worthwhile provided readers remember that this is just one valid approach. It should interest researchers. Many parameters are shown empirically to be conservative; this presents a stimulating challenge for more mechanistic approaches to explain.

Bruce Marshall

Agricultural Research Policy in an Era of Privatization. Edited by D. Byerlee and R. G. Echeverria. Wallingford, UK: CABI Publishing (2002), pp. 300, £49.95. ISBN 0-85199-600-0. DOI: 10.1017/S0014479703231410

Agriculture is essentially a private-sector activity, but much of its research has been driven and supported by far-sighted public-sector programmes that have recognized its ability to deliver essential public goods, assist in poverty alleviation, and help ensure food security. In recent years, however, governments, made complacent by efficiency gains in agriculture and the absence of catastrophic events in production agriculture, have reduced their commitment to research and development and are likely to continue to until food demand exceeds supply. This has coincided with commercialization and privatization of many areas of agricultural research that hitherto

have been regarded as being in the public sector. With the possibility of acquiring valuable intellectual property, certain aspects of agricultural research have attracted substantial funding, but the current state of depressed commodity prices, and company mergers and acquisitions, have raised concerns about the interface between the public and private sectors.

The editors state that the objective of this book is to synthesize contemporary experiences with changing public- and private sector roles in funding and executing agricultural research, with the emphasis on developing countries. Chapters overlap somewhat and cover scene-setting, support of research by producer organizations, public-private partnerships in research, and the response of the public sector to expanding privatization. Specific examples are drawn from ten countries, and brief reference is made to recent developments in eight others. All the articles are written well, constructively critical, usefully referenced, and carefully edited. Much of the focus is on plant breeding, with little mention, for example, of livestock breeding and veterinary medicine. This book should be a useful source of reference in synthesizing strategic roadmaps for agricultural research in the developing world, and its interaction with agriculture in the industrialized world.

J. R. Hillman

Agroecological Perspectives in Agronomy, Forestry and Agroforestry. By P. A. Wojtkowski. Enfield, USA: Science Publishers Inc. (2002), pp. 356, US\$48.00. ISBN 1-57808-217-X. DOI: 10.1017/S0014479703241417

This book documents clearly the agro-ecological perspectives of agriculture and forestry in a breadth that is highly desirable for the more traditional students and professionals not familiar with the concepts, principles and practices that underlie agro-ecology. The book is well structured, starting with explanations of ecological principles, land-equivalent ratios, spatial theory, integrated pest management and sustainability. It then builds on from management options, economic analysis, diagnosis and design, to a thorough description of agronomic, forestry and agroforestry technologies and water management. It concludes with a detailed look at complex-ordered, and complex-disarrayed agro-ecosystems: landscape design, and some circumspective consideration of research, adoption and some general agro-ecological perspectives.

Those familiar with the subject of this book may be surprised by the absence of references to many recent seminal publications on tree/crop interactions, tropical agroforestry, multistrata agroforests, tropical soil management, agri-biodiversity, tree domestication, landscape mosaics, and even agro-ecology. These absences detract from its use as a standard text aimed at informing the reader of the wider literature. However, the book is still a very valuable and highly recommended text for anybody wishing to understand the issues surrounding sustainable land-use and approaches to overcoming non-sustainable practices in the rural economy.

R. R. B. Leakey

Quantitative Genetics, Genomics and Plant Breeding. By M. S. Kang. Wallingford, UK: CABI Publishing (2002), pp. 400, £75.00. ISBN 0-85199-601-9. DOI: 10.1017/S0014479703251413

This book resulted from a symposium on 'Quantitative Genetics and Plant Breeding in the 21st Century' that was held in Baton Rouge, Louisiana in March 2001. There are forty-seven international contributors with expertise in quantitative genetics, crop improvement, tissue culture and statistics. After an historical introduction, the first section comprises thirteen chapters on genomics, quantitative trait loci and tissue culture, and the second comprises ten chapters on genotype \times environment interaction and stability analysis. However, the chapters can be read in virtually any order according to one's interests. Most deal in general terms with analytical methods, concepts, ideas, issues, models, simulations and strategy, but six are devoted to specific examples from the cereals, with three on maize, two on rice and one on barley. As editor, the symposium organizer, Dr M. S. Kang has assembled a collection of papers, including his own overview of genotype \times environment interactions, which breeders and geneticists should find stimulating and useful as they take up the challenge of applying genome-based knowledge and technology to scientific crop improvement. Breeders can at last look forward to designing programmes based on knowledge of gene number, location and expression, of recombination events and of the genetic control of biochemical pathways that affect crop physiology and adaptation to agricultural environments and end uses.

John E. Bradshaw

Fruits for the Future 2 – Ber. By O. P. Pareek. Southampton: International Centre for Underutilized Crops (2001), pp. 290, no price quoted. ISBN 854-327-525. DOI: 10.1017/S001447970326141X

This book gives a very comprehensive overview of the *Ziziphus* species forming the group of fruits known as *ber*.

There are seventeen chapters, covering topics from taxonomy and reproductive biology, through to propagation, disease management and harvesting. The final chapters deal with the current status of research and future needs. A comprehensive bibliography, plus appendices concerned mainly with available cultivars and listing of relevant research groups, completes the volume. There are 35 colour plates, of average to good quality, and several line drawings.

The in-depth consideration of fruit quality and nutritional composition is particularly appropriate since, due to their nutritional value, *ber* (*Z. mauritiana*) and jujube (*Z. jujuba*) should play increasing roles in local dietary needs in the areas where they grow in Asia. Additionally, these and other *Ziziphus* species have considerable pharmacological potential. The Breeding and Genetic Resources sections are rather weak – the opportunities offered by molecular techniques are barely touched upon, and there is too much reliance on exhaustive listing of cultivars.

The author is to be congratulated in bringing together so much diverse information on these crops. The book can be highly recommended for anyone with an interest in nutritionally significant tropical crops, and for any library catering for a readership with broad interests in this area. Together with the companion extension manual planned for use by farmers, field workers and policy makers, it will go a considerable way towards providing a resource for students and researchers and encouraging the further production, processing and marketing of *ber*.

Rex Brennen

Plant Biotechnology and Transgenic Plants. Edited by K-M. Oksman-Caldently and W. H. Barz. New York: Marcel Dekker Inc. (2002), pp. 28, £121.75. ISBN 0-8247-0794-X. DOI: 10.1017/S0014479703271416

This volume contains a wide-ranging array of topics in plant biotechnology with particular focus on transgenic plants. The book is ambitious in setting out to cover all aspects where transgenic plant biotechnology has been used to produce improved crops or to further our knowledge of how plants function. Additionally, two chapters are devoted to the discovery of plant-derived bioactive compounds. Plant tissue culture, transformation methodologies and bioreactors are also described in appropriate detail. The volume represents a timely assessment of this rapidly developing area of plant science, and it is useful and interesting to have so much information about transgenic plants assembled in one book. The chapters on transgenic plants pass logically from general metabolism to carbohydrates, oils, flavours and fragrances and cell walls. Each chapter is as up-to-date as possible for a volume of this kind, most containing relevant references up to 2000. Most chapters review the biochemical context of the work and provide a detailed reference list, and thus are of great value to the reader who wants to pursue a subject further.

Further chapters deal with transgenic approaches to dealing with stress, both oxidative and environmental. Strategies for engineering resistance to pathogens, viruses, microbes and insects are also reviewed in detail. The final chapter considers the possibility of using plants to control heavy metal accumulation and pollution in soils. Overall I think the editors have succeeded in assembling a comprehensive review of transgenesis in plants that will be of interest to all students and researchers in this field.

Mark Taylor

Agriculture, Hydrology and Water Quality. Edited by P. M. Haygarth and S. C. Jarvis. Wallingford, UK: CABI Publishing (2002), pp. 528, £85.00. ISBN 0-85199-545-4. DOI: 10.1017/S0014479703281412

This book is divided into three sections. The first has pollutant-based reviews of agriculture as a source of pollution for surface and groundwater. Most of these chapters are excellent, although the lumping together of pesticides and persistent organic pollutants (POPs) was odd. The former are directly attributable to agriculture production, while POPs are generally derived from atmospheric deposition and happen to fall on agricultural land. Section two looks at the dominant role of hydrology in transporting pollutants (mainly N and P) from

source to receptor and discusses issues of scale, mobilization, interactions with solid phases, relative importance of pathways and wetlands. The final section discusses case studies and this is very valuable as it puts the scientific discussion of the first two sections into a practical context.

One criticism is that the first two sections relate findings and experiences from Western Europe and North America, with some reference to Australia. This clearly reflects the bulk of published information and the background of the section authors. Only in the last section is there a significant discussion of problems in developing countries (Zimbabwe).

This is a very welcome collection of overviews summarizing the state of knowledge on the potential water quality impacts of practicing agriculture. There is some overlap in the introductory sections of many of the chapters, but this does mean they can be read as stand-alone sections. I see this book as being of interest to a wide readership from undergraduates to research scientists, regulators and policy makers.

Richard Williams

Physical Methods in Agriculture – Approach to Precision and Quality. Edited by J. Blahovec and M. Kutilek. New York: Kluwer Academic/Plenum Publishers (2002), pp. 454, £130.00. ISBN 0-306-47430-1.
DOI: 10.1017/S0014479703291419

Although these are the proceedings of a conference by the same title, that title is misleading to the normal reader, particularly since the cover presents the title and sub-title interleaved so that they read: *Physical Approach to Methods in Precision Agriculture and Quality*. The contents of the book are, themselves, a strange admixture.

Many of the chapters are, indeed, about physics. They include several on soil physics at the level of soil pores and their characteristics, and the effects of various management practices on soil compaction, pore dimensions, and water movement. They also include solar power for agricultural applications, the engineering design of grain silos, and the mechanical strength of eggshells.

Chapters on the physics of food during processing lead, via one on transgenics for altered physical properties of plants, to a discussion of the opportunities for, and the role of, transgenic crops (GMOs). Still other chapters deal with assessing attributes of quality in harvested fruits but, as presented, these have little to do with agriculture. In contrast, there are actually two chapters that deal with the concept normally thought to be defined by the keywords, 'physics', 'agriculture' and 'precision'. These deal with 'precision farming' of cereals, and monitoring frost injury.

One strains to effect a linkage between these diverse topics, each of which has been well enough handled in its own right.

D. K. L. MacKerron

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*.

Flax Genetic Resources in Europe. Compiled by L. Maggioni, M. Pavelek, L. J. M. van Soest and E. Lipman. Rome: International Plant Genetic Resources Institute (2002), pp. 79, no price quoted. ISBN 92-9043-535-3.

Bibliography of the Genetic Resources of Traditional African Vegetables. Neglected Leafy Green Vegetable Crops in Africa. Vol. 2. Compiled by N. M. Mnzava, J. A. Dearing, L. Guarino and J. A. Chweya. Edited by H. de Koeijer. Rome: International Plant Genetic Resources Institute (2002), pp. 110, no price quoted. ISBN 92-9043-531-3.

The Economics of Conserving Agricultural Bio-diversity On-Farm. Research Methods Developed from IPGRI's Global Project 'Strengthening the Scientific Basis of In-Situ Conservation of Agricultural Biodiversity'. Edited by M. Smale, I. Mar and D. I. Jarvis. Rome: International Plant Genetic Resources Institute (2002), pp. 73, no price quoted. ISBN 92-9043-544-5.

Global Research on Underutilized Crops. An Assessment of Current Activities and Proposals for Enhanced Cooperation. By J. T. Williams and N. Haq. Southampton: International Centre for Underutilized Crops (2002), pp. 46, no price quoted. ISBN 92-9043-545-3.

Global Review of Commercialized Transgenic Crops: 2001 Festschrift: Bt Cotton. By C. James. Ithaca, NY, USA: ISAAA (2002), pp. 184, US\$25.00. ISBN 1-892456-30-3.

Atlas of Wild Potatoes. By R. J. Hijmans, D. M. Spooner, A. R. Salas, L. Guarino and J. de la Cruz. Rome: IPGRI (2002), pp. 130, no price quoted. ISBN 92-9043-518-6.

European Collections of Vegetatively Propagated Allium. Report of a Workshop, 21–22 May, 2001, Gatersleben, Germany. Compiled by L. Maggioni, J. Keller and D. Astley. Rome: IPGRI (2002), pp. 101, no price quoted. ISBN 92-9043-528-3.

Global Status of Commercialised Transgenic Crops. By C. James. Ithaca, NY, USA: ISAAA (2002), pp. 34, US\$35.00. ISBN 1-892456-31-1.

Impacts of International Maize Breeding Research in Developing Countries, 1966–98. By M. L. Morris. Mexico, DF: CIMMYT (2002), pp. 54, no price quoted. ISBN 970-648-091-9.

World Wheat Overview and Outlook 2000–2001. Developing No – Till Packages for Small-Scale Farmers. Edited by J. Ekboir. Mexico, DF: CIMMYT (2002), pp. 66, no price quoted. ISBN 1665-1871.

Impacts of International Wheat Breeding Research in Developing Countries. By P. W. Heisey, M. A. Lantican and H. J. Dubin. Mexico, DF: CIMMYT (2002), pp. 73, no price quoted. ISBN 970-648-090-0.

Book currently under review

Quantitative Analyses of Data from Participatory Methods in Plant Breeding. Edited by M. R. Bellon and J. Reeves. Mexico, DF: CIMMYT (2002), pp. 144, no price quoted. ISBN 970-648-096-X.