BOOK REVIEWS

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This book is essentially a primer and laboratory manual for scientists new to the field of DNA fingerprinting, although it does contain detail that would be of interest to more experienced scientists. After a good, general introduction to the sources of genetic variation (Chapter 1) and a very useful overview of the main PCR-based fingerprinting techniques and their variants (Chapter 2), the book turns to its main purpose. A considerable portion of the book (Chapter 4) is dedicated to laboratory protocols and provides all that is necessary to perform the various techniques. However, the protocols themselves are not as clearly laid-out as they could have been – if a person needs to turn to a manual to perform a task then clear, step-by-step protocols, with high quality diagrams, where necessary, are called for. In addition, much of the early part of Chapter 4 deals with DNA extraction and purification, running gels etc., and could have been left for other laboratory manuals. Likewise, Chapter 3 on laboratory equipment seems superfluous.

In terms of balance, there is too much attention paid to RAPDs, even though, as the authors themselves acknowledge (page 207), the technique was already being side-lined in the 1990s because of its ‘lack of robustness and reproducibility’. The more recent techniques, SNPs and microarrays, are smashed into a short, nine-page chapter at the end of the book. Greater attention to these would have made for a more interesting read and given the book a longer shelf life.

Mark Winfield


This is not an easy read for the general biologist. Nor could it have been an easy task for the editor, but Robert Henry has expertly marshalled thirty other contributors to produce fifteen eclectic chapters on plant diversity and evolution. It appears there has been a movement of the centres of such studies away from Europe towards Australia and USA.

Though some chapters would help the life sciences undergraduate, the book is really for professional botanists. Evolutionists will find material to complement their own researches – mitochondrial variation, the chloroplast genome, secondary metabolites or cell wall chemistry for instance.

The ‘AGP’ (Angiosperm Phylogeny Group) classification of 1998 that attempted to unify classifications based on individual views has already been updated (‘AGP II’ of 2003) and the changes over five years have resoundingly confirmed the wisdom of moving from gross morphology as the basis for classification to DNA-based studies.

Some chapters are very complex. ‘Evolution of the Flower’ by Soltis et al. for example, has 11 authors from seven institutions and could form the basis of a whole book – in which case complex diagrams of clades and evolutionary topology, plus painstaking evolutionary trees based on enzyme and other protein patterns could be absorbed more easily.

The book comes with this recommendation that it be used diligently to study opinions derived from other techniques in the interest of eventual uniformity of views. Finally, the chapter on the ecological importance of diversity reminds us of Kim and Weaver’s (1994) prediction that the survival of mankind ultimately depends on the preservation of biodiversity.

Trevor Walker


The aim of the book is to ‘increase awareness and knowledge about grasses from rangelands and grasslands of temperate regions and in particular about a selection of wild grasses, so that these species can be better known and, hopefully, more widely used’. The book contains chapters on importance and diversity of grasses and grass communities, diversity of grass uses, morphology and physiology of grasses, profiles of individual grass species, advantages of wild or secondary grasses and complex multispecies and multivariety mixtures, and some prospects for wild and little-selected species.

The book is well laid out and written in a readable style. It is primarily aimed at agronomists and has a central theme relating to the agronomic value and potential for ‘improvement’ of a wider range of wild grasses than is currently practised. There is also a lot in the book to interest ecologists. The chapters relating to grassland communities and their development and morphology and physiology make good background reading for anyone interested in grassland ecology. There are also useful guides for the beginner to grass identification, such as the figure showing heading date ranges, and the vegetative key is user friendly and accessible for non-ecologists.

This is an excellent book for anyone interested in the agronomy and ecology of temperate grasses.

Jerry Tallowin


This is an impressive text which encapsulates a considerable body of knowledge regarding these two tropical crops. The editors should be congratulated for bringing together the experiences and knowledge of over 20 researchers located throughout the world and on the consistency and quality of this book. I found it particularly useful that many of the authors cited information from more local sources that may not be universally available. The book is divided into 14 chapters and starts with a description of the origins and history of the crop, followed by details of basic crop botany. Subsequent sections deal with propagation, biotechnology and breeding. The remaining chapters cover a logical sequence of crop development through flowering to post-harvest, within which are contained contributions on physiology, pests and diseases. The text is well structured, clear and interesting, particularly for those ‘students’ who may not be familiar with these crops and wish to gain rapidly a clear and effective initial understanding.

Generally, the book contains an excellent collection of illustrations, the colour ones being of particular value. Only occasionally is the purpose of some of the other images not obviously apparent. This is clearly a must have book for all those interested in the growing of litchi and longan and one envisages that as crop culture and biotechnology advance updated versions will be in demand. The acquisition of this book by researchers will undoubtedly provide them with great enthusiasm and a clear insight into the development of future research.

C. T. Atkinson


The author has unique knowledge of *Theobroma cacao*, having devoted his working lifetime to understanding the genetics of cocoa and its allies. The core of his book is an immensely authoritative and highly detailed 130 page description of the uncultivated cocoa that has been sampled from the Amazonian and circum-Caribbean regions. A further 60 pages describe the globally cultivated populations as secondary depositories...
of variation. The emphasis is on morphological traits. The text is well complemented by numerous maps, photographs and figures, with a good index. A huge assembly of information is used to interpret the origin of cultivated cocoas and reconsider the classification that has stood for sixty years, and to review how the variation can be used in the genetic improvement of the crop. Some of the historic references are invaluable.

The book is complementary to the on-line International Cocoa Germplasm Database. Cross-referencing the two would have been easier had Dr Bartley used the international codes for cocoa germplasm to identify the clones obtained from each location. In the discussion of utilization of cocoa germplasm, a wider and sometimes different choice of the literature of the last half-century would have increased the authority of the interpretation. However, these are minor matters compared to the permanent availability of Dr Bartley’s unrivalled knowledge of the material.

This is an indispensable reference book for all who have an interest in the genetic resources of cocoa. Great credit is due to the Biscuit, Cake, Chocolate and Confectionary Association for sponsoring its publication. However, the greatest tribute is to the author for the half-century of research and many months of writing that went into this work.

Rob Lockwood


This textbook covers most important aspects of the soil-water-plant continuum. It is an excellent reference book for undergraduates, postgraduates and established scientists alike. Each subject is covered from first principles, relating back to the underlying physics and chemistry of the problem. Excessive mathematical detail is avoided to keep a wide audience on-board, so that the book remains appropriate for students of biology and agriculture, in addition to agricultural engineers and soil physicists. The principles of the instrumentation used to measure plant and soil water relations are covered in most chapters. The book crosses disciplines successfully, describing both the physics of water movement and behaviour and the anatomy of plants in relation to water uptake. Topics covered in detail include the physics of water movement and availability in soil, measurement of soil water potential and content, water flow through plants, measurement of plant water status and crop-water relations.

The book has been produced to a high standard, with clear diagrams and graphs throughout. The text gives very clear explanation and discussion of the subject, making the assumptions and limitations of our understanding clear. As with most single author texts, one can think of some additional recent references which would have benefited the text, but in general the coverage of the subject is good. Unusually, some short biographies are given of leading scientists in the research field described in each chapter. These include such names as Boyer, Darcy, and even Sir Isaac Newton, and add an extra element of interest. Retailing at £45, the hardback is just about affordable for a personal bookshelf in addition to the library, and is a very worthwhile investment.

Glyn Bengough


This book provides a North American view of environmental quality in relation to the broad topic of the function and role of soils. The emphasis is on productive systems and the book is suited to advanced teaching or general reference with sections containing practical problems and worked examples. The content of this edition has been updated to reflect current trends with new chapters on environmental testing and nutrient management planning.

Part I of the book provides an overview of environmental quality from the aspect of soil science and describes the interaction of soil with atmosphere and hydrosphere, and the principles of analysis and interpretation of related samples. Part II deals with nutrients, management and environmental quality and has individual chapters dealing with the cycling and transformation of nitrogen, phosphorus and sulphur and their effects on environmental quality. There is no equivalent chapter dealing with the cycling and transformation of
carbon, which could have been a valuable addition given the current global interest in carbon sequestration. However, information on carbon is distributed throughout the book. Part III deals with inorganic and organic contaminants. The degradation of organic compounds by micro-organisms is an important process but it is not considered in much depth. Finally, Part IV considers contaminant assessment and remediation strategies. Each chapter is provided with references and supplementary materials including some direct links to internet sites.

In summary, the latest edition provides updates to an excellent, well-written book that has much value beyond its geographical origin.

Charlie Shand


This book has a clear defined purpose: a handy one volume student guide to soil sampling and analysis. It does not pretend to replace more exhaustive volumes, but does provide all the information needed for many soil analyses and their interpretation. The second edition, appearing ten years after the first, retains most of the original content but has been updated and expanded. There are new chapters on Soil and Plant Test (including typical data for crop plants), Scanning Electron Microscopy and EDAX, and Nuclear Magnetic Resonance Spectroscopy. Both wet chemical and instrumental analysis are covered. Wet chemistry provides an accessible way for students (and others) to analyse a wide range of soil elements and ions without the need for dedicated expensive instruments. The principles of colorimetric analysis described here can also be applied to routinely used automated systems.

There is an added section on metric and American units, intended to clarify this topic for United States students, a most laudable aim. However, both SI units and chemical concentrations receive a very pedantic treatment which I found more confusing than enlightening. I suspect US students may find the same; non-American readers should skip it.

The book is well indexed and referenced. While reviewing it, I was asked about the Walkley-Black method. A quick look in the index led me to a detailed description of the method, the calculations and assumptions involved, and alternative methods for soil organic matter determination. The book serves its purpose well.

Charlie Scrimgeour


Water has always been high on the agenda of many people, but none more so than farmers. Whereas too much water is periodically a problem in some agricultural areas, drought is a more pernicious problem in the vast croplands and pastures that are rain-fed. Meeting the growing demand for more and better food for an expanding global population is a major concern; experts look increasingly to the production potential of rain-fed agriculture. Given this situation, what better time than now to publish a comprehensive review of drought and water crises.

The starting premise is that more needs to be done to encourage governments to utilize recent advances in the scientific understanding of drought, and the development of improved tools for drought planning and mitigation. The complexity of drought does make it different from other natural disasters. The book devotes considerable effort analytically to address the intricacies of the definition of drought, the development of indicators, and the problems of prediction, vulnerability assessment, preparedness planning and policy formulation. Chapters also cover mitigation through water conservation, and a number of case studies. Coverage of drought experience in the semi-arid tropics of India and Africa is sparse relative to that in North America and other regions, but the stated purpose of the book is to catalogue recent advances in drought research and policy with the intention that the lessons learned can benefit tropical countries. The editor facilitates this by systematically drawing the key issues together in both an introductory and a concluding chapter.

Eric Craswell

This concise book represents a comprehensive source of recent information on the assessment of irrigation and drainage performance, a subject of immense importance as the world’s water supplies for new irrigation schemes become increasingly scarce and existing schemes are threatened by managerial difficulties and degradation processes. The three authors, coming from the Netherlands, UK and Sri Lanka respectively, have also drawn on the very extensive world-wide experience of the International Commission on Irrigation and Drainage working Group on Performance Assessment of Irrigation and Drainage. Each of the six chapters is followed by an extensive list of references.

The emphasis is on the assessment of water use and managerial efficiency of schemes, with schematic diagrams illustrating the concepts of successful assessment, together with examples of practical results drawn largely from schemes in the tropics, including in particular Argentina, Australia, Brazil, Egypt, India, Sri Lanka, Pakistan, and Turkey.

Attention is given to the need for assessment operations to be conducted with appropriate consultation at all levels (scheme providers, management, individual water users) and at all stages of assessment (planning, conduct, interpretation) as well as during implementation of changes based on assessment findings. Other topics receiving attention are financial viability, remote sensing, diagnostic techniques and data management.

Two appendices provide tabulated lists of system descriptors and performance indicators with citations to relevant literature. Indicators are grouped under Water delivery and utilization (33 indicators); Agricultural production (17); Agricultural economic and financial (13); Socio-economic (10) and Environmental (5).

Brennan D. Soane


This edited collection of 17 papers derives from a workshop held in Switzerland in July 2003 to explore the diverse forms and environments in which organic P occurs. Building on recent analytical advances that allow identification and separation of organic P in soil, water and other environmental samples, the bulk of the papers consider the processes controlling the dynamics of organic P and how these processes are integrated at the ecosystem level. It is only recently that much attention has been paid to organic P in the environment and relative to what is known about inorganic P, such studies are in their infancy. Most soils, though, generally contain at least 30% of their total P in organic forms and occasionally up to 80%. Phosphatase enzymes released by microbes and some plant roots can make some of this organic P potentially available to crop roots, but the quantitative significance of such processes is poorly understood. What is now better understood is the mobility of organic P in soils and that it is a key component of the P transfer process in both natural and managed environments, accounting for a large proportion of the total P in drainage waters. This is important because organic P compounds are biologically available in surface water resulting in algal blooms. This book contains papers of a high standard that link well to each other to provide a picture of P that encompasses terrestrial and aquatic ecosystems. The final chapter, on the future direction of research, is the only disappointment in an otherwise stimulating collection of papers.

P. J. Gregory


This collaborative book by Swedish, African and Asian scholars identifies the factors central to the success of the Asian Green Revolution and asks how these can help improve African agricultural productivity. The underlying thesis is that the Asian Green Revolution was more than a technological package.

The first two chapters elaborate a causal and explanatory model of the Asian Green Revolution: this is state-driven towards a goal of self-sufficiency in food grains through the promotion of efficient food grain commodity chains. Beyond the state initiative, stimulated by a threat of political instability from food shortages, the model is market mediated and smallholder focused.
Chapters 3 and 4 review the Green Revolution in Japan, India, Indonesia, the Philippines and Bangladesh, and outline the evidence on which the model is based. The next eight chapters examine experience in agricultural development in Africa. Chapter 7 reports a survey of the perceptions of development of 3000 African rural householders. Other chapters highlight the role of the state, the impact of structural adjustment, and other policy and institutional dimensions. Chapters 13 and 14 address the implications of Asian experience for Africa, offer final conclusions and a look ahead.

The editors admit the comparative analysis ‘is not a rigorous test’, yet the evidence underpinning their Asian model is compelling. Ten years earlier it might have stimulated novel development strategies; today this model already underpins the efforts of the international community and many African governments to widen the approach to agricultural development.

Although the quality of the contributions varies, I particularly liked the book for bringing household level information to bear on the issue and for the analyses of both Asian and African experiences.

Mike Collinson


This book assesses the geographical, scientific and social contexts of organic farming. The author cites her own research findings and uses these in conjunction with what appears to be authoritative sources. The text evidences comprehensive research and is well referenced.

While the research, surveys, interviews and comparative studies make interesting reading, the book becomes of more practical application when the author investigates how the theory and science of organic production can be successfully translated into farming practice. This is done through detailed assessment of existing, profitable organic producers over a ten-year period. The pragmatic use of these real-life examples increases the relevance and realism of the findings and enhances the credibility of the conclusion that organic production is a viable alternative. The book finishes by considering how organic production could be facilitated through specific policy actions. Being an American publication, the primary focus is on the United States. However, the author does refer to European research and policy, and many points are applicable to organic production in the UK.

The tone is constructive. There is an empathy with conventional farmers, which helps to advance the case for organic production without causing alienation. The arguments are presented sensibly and emotive language is avoided. This book, while intelligently written, is easily read and should appeal to a wide readership interested in the realism of future food supplies.

Lorna Holland

Books currently under review:


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*.


