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BOOK REVIEWS

Alternative Irrigation. The Promise of Runoff Agriculture. By C. J. Barrow. London: Earthscan Publications Ltd (1999), pp. 240, £40.00 hardback; £15.95 paperback. ISBN 1-85383-495-5.

This excellent and very modestly priced book will serve both as an introduction and a well researched reference text on a much neglected aspect of irrigated agriculture. The opportunities for local people to participate in the planning, construction and management of successful runoff projects are in contrast to the social disruption, frequent failures and excessive costs encountered on many large-scale schemes.

The detailed attention given to the technical principles of runoff harvesting and soil and water conservation is enhanced by numerous clear, well annotated diagrams. Examination of current and historical indigenous runoff schemes in north and south America, the Mediterranean, the Atlantic islands, south-east Asia and Africa is accompanied by valuable explanation of indigenous terminology.

Although indigenous schemes were developed explicitly to secure food supplies under local conditions of low or erratic rainfall, the author examines the need to expand, upgrade and rehabilitate traditional schemes to meet modern social and economic conditions.

The list of acronyms contains some items of marginal importance, for example, RRA (rapid rural appraisal), as well as some slips such as NaCl (sodium). A list of some 560 up-to-date references, a useful list of relevant journals and abstracts and a good index complement the text.

B. D. Soane

Inducible Gene Expression in Plants. Edited by P. H. S. Reynolds. CAB INTERNATIONAL (1999), pp. 256, £45.00. ISBN 0-85199-259-5.

This book considers various aspects of the induction of gene expression at the transcriptional level in plants; there are eleven chapters prepared by appropriate leaders in the research field. An initial overview chapter by the editor describes a taxonomy for the following chapters based on the induction of gene expression either as a response to environmental or developmental signals, or effected by control systems from non-plant backgrounds. Like the promoters which are the unifying theme, each classification includes elements of varying importance. The discussions of endogenous plant promoter-based systems focus on the conditions under which they are induced (with chapters on plant hormones and stress, heat shock, wounding and senescence), important promoter elements, and their potential transgenic application, which is complicated in some cases by the natural response. The chapters on non-plant systems (tetracycline, copper or hormone regulated), whose underlying principles are well-explained, concentrate on their adaptation to, and advantages and efficacy in, plant application. Thus there is much of interest here for both the plant biologist and the genetic engineer, although both themes could have included further examples, such as the application of alcohol-induced gene expression (mentioned briefly in Chapter One), and sucrose-mediated gene regulation (as a complement to the discussion of nitrate regulation).

G. C. Machray

Agriculture and the Environment: Perspectives on Sustainable Rural Development. Edited by E. Lutz assisted by H. Binswanger, P. Hazell, and A. McCalla. Washington DC: The World Bank (1998), pp. 383, US\$35.00. ISBN 0-8213-4249-5.

This book, derived from a World Bank Seminar on the topic, offers a compendium of well-informed commentary on agriculture–environment issues in relation to the developing world. It is divided into three main sections. The first deals with policy issues; the second an institutional perspective and the third a technical perspective.

The policy section contains seven chapters on themes ranging from property rights to the impact of trade reform. The second section contains a further seven papers, many of which focus on designing projects at a local level to ensure their success, a lesson that might not be wasted in developed countries. The final section comprises eight chapters, some of which are based on principles (for example, maintaining biodiversity), whilst others look at particular examples such as Integrated Pest Management in Indonesia. They reflect the range of projects currently taking place or recently implemented.

There is an inevitable tendency for such a book to comply with the world view of the sponsors of the seminar that led to this book. Many of the papers are by insiders or those close to the orthodoxy of the World Bank. Hazell's concluding piece in the first section argues for a need to build environmental sustainability into policy, including a need, wherever possible, to privatize property rights, but transforms Bromley's (an outsider's) expert and variant views into World Bank orthodoxy. Further, in Narayan's paper on participatory rural development, twenty of the twenty-six references are produced by the World Bank and acknowledged key figures are unmentioned.

This is a valuable compendium from a multidisciplinary team of authors for anyone interested in the debate about sustainable agricultural development in developing countries. It does not break new ground, but does provide a useful statement of the conventional wisdom of key development agencies, in particular the World Bank.

W. Slee

The Dilemmas of Water Division. Considerations and Criteria for Irrigation System Design. By L. Horst. Colombo, Sri Lanka: International Water Management Institute† (1998), pp. 123, US\$40.00, US\$20.00 (developing countries). ISBN 92-9090-365-1.

At a time when words such as 'agronomy' and 'engineering' scarcely figure in a politically correct overseas development vocabulary, this book provides great encouragement. Professor Horst starts by noting that a large discrepancy exists between design assumptions and operational reality on many channel-fed irrigation schemes. He then poses two questions: Would it be possible to design irrigation systems taking into account human and institutional aspects? If so, what would be the repercussions on the type of technology? To answer these questions, the technicalities of the division of water flows from headworks to farmer's field must be as clearly understood as the social and managerial contexts within which the scheme operates. There is a very useful range of photographs and diagrams of water distribution structures. However, engineering matters are discussed in the context of effective water distribution to the farmers and the realities of present day scheme operation. A widening gap in understanding between the design office and the water guards and farmers is considered to be a major cause of the poor performance of schemes which incorporate complex water division systems. Horst favours simplification of water delivery and technology, and concludes with practical examples from his extensive tropical irrigation experience.

H. Gunston

†Until recently, the International Irrigation Management Institute (IIMI).

Hazard Identification of Agricultural Biotechnology. Finding Relevant Questions. By A. van Dommelen. Utrecht: International Books (1999), (distributor Jon Carpenter Publishing, Charlbury), pp. 238, £19.95. ISBN 90-5727-034-X.

The question addressed in this book is: How can science be used as a basis for public policy in areas where there is no consensus among scientists? It is discussed mainly in the context of the controversy over the safety of the release of genetically modified organisms (GMOs), including crop plants. The author's prescription for resolving disagreements is a rigorous intellectual analysis of the underlying science, in particular by identifying the 'set of relevant questions' for each problem. He demonstrates easily that some of the claims that have been made for the safety of GMOs lack a sound scientific foundation, but it is a pity that he does not offer a similar critique of some of the more fanciful risk scenarios. I suspect that the full implementation of van Dommelen's approach might be intellectually satisfying, but would lead to a never-ending research agenda and a paralysis of technological innovation. Nevertheless, for anyone interested in the interface between science and politics, or in the science of risk assessment, this book contains many stimulating thoughts, although it is a difficult read because the style of English is prosy, repetitive and sometimes inaccurate.

David Robinson

Tropical Agroforestry. By P. Huxley. Oxford: Blackwell Science (1999), pp. 371, £69.50. ISBN 0-632-04047-5.

The author, widely known and respected in his field, has produced an excellent overview of the subject which should be widely used by students, researchers and practitioners. The subject matter is presented clearly in six sections. The first presents a wide scoping introduction and is the only section which probably best fulfils the general statement at the start of the book 'People are the key elements in agroforestry'. Despite this, and understandably as work in the field is very thin, the book concentrates on biological aspects of agroforestry and is relatively weak on socio-economic principles and examples. The next section, on functional aspects, deals largely with exploitation of the spatial diversity which agroforestry systems offer. The tree crop interaction is explored in detail in the third section. Two further sections on the characteristics of spaced trees and their impact within a range of land-use systems are well illustrated with examples. I particularly like the author's willingness to use examples from temperate systems – this encouraged me greatly, as it showed that many of the principles in the book and the vast bulk of literature on tropical agroforestry are highly applicable to study of temperate systems. The final section on agroforestry research is particularly novel and a stimulus to thought and action.

Throughout the book the author conveys the refreshing attitude that this is by no means an exact science and there is much left to discover, for example p. 311 'In agroforestry there is so much to be learned that no available investigative method should be neglected.'

The book is well and clearly illustrated, particularly valuable for students and I found only a few errors in the impressive bibliography. I would highly recommend it to those wishing to learn or be stimulated into further research into the broad vista of tropical agroforestry.

J. H. McAdam

Against the Grain: The Genetic Transformation of Global Agriculture. By M. Lappé and B. Bailey. London: Earthscan Publications Ltd (1999), pp. 163, paperback £10.99. ISBN 1-85383-576-3 (hardback), ISBN 1-85383-657-5 (paperback).

Against the Grain purports to set out a balanced view of genetic modification of crop plants. Although one suspects it earlier, it is not until page 71, where the authors refer to 'our organization filing a petition to halt the continued registration of *Bt* crops', one realizes that this is a propaganda publication for 'our organization' which is not identified.

The book only deals with GM issues up to 1998 but since then many things have changed. This would be acceptable if the book was factually correct and presented potential GM problems against the baseline of those accruing from current breeding and intensive agricultural practices; but it was not. I was continually annoyed by the scientific errors and the junk science as well as the factual errors such as 'Transgenic crops are often marketed after a single test plot is harvested'. Even the glossary, to help the non-scientist, contains scientific errors – 'Coleoptera: the **genus** that contains the beetles'.

This book will be good reading for those who totally oppose GM crops, as it will reinforce their views. For those who are seeking a balanced presentation of the issues on which to make their own judgements, there are other more informative sources of information.

Roger Hull

Vegetable Seed Production. (Second Edition.) By R. A. T. George. Wallingford: CABI Publishing (1999), pp. 328, £49.95. ISBN 0-85199-336-2.

This new and comprehensive book has been needed for a long time by students, advisors, aspiring seedsmen and those who want to set up a vegetable seed industry in developing countries. It will increase general understanding of the complexity and difficulty in producing quality vegetable seed. Whilst this edition is up to date on the technical aspects, the practical side of seed production is somewhat outdated. Much of the information relies on American practice, giving little coverage to Asian or European methods, which may be better suited for developing countries.

The subject is covered in two parts, the first describes the organization and principles of a successful seed industry, including chapters on the important subjects of seed storage and seed handling. The second part covers the most important vegetable crops, describing practical aspects of seed production and includes interesting general information. For each crop there is a list of diseases, which are mistakenly listed as seed-borne when only a smaller number are.

More pictures, particularly in colour, would have given added interest to this book, which is long on theory but short on practice. Nevertheless, it is a very welcome and useful book and will be well received.

P. Dawson

Mineral Nutrition of Crops: Fundamental Mechanisms and Implications. Edited by Z. Rengel. New York: Food Products Press (1999), pp. 399, US\$125.00. ISBN 1-56022-880-6.

This book consists of twelve chapters, each by different authors, reviewing rhizosphere factors, uptake kinetics, molecular biology of ion transporters, long-distance nutrient transport, root size and container volume, role of nutrients in photosynthesis and disease resistance, seed reserves, nutrient uptake efficiency and breeding for this, and finally two chapters involving the soil: the first on water and nutrient fluxes in the profile, and the second on simulation models.

The chapter by Frank Smith on molecular biology of transporters is new science: it will be fascinating to see whether transgenic plants can be bred to extract particular nutrients more efficiently from the soil. However, the business of efficient extraction, which is a major theme of the book, applies only to those elements which are present in large quantities, but sparingly available in the soil, such as most trace elements. It is not relevant to nitrogen, which is the main element limiting world food supply. In the preface the editor states that 'judicious fertilizer management based on understanding complex interactions and the multitude of mechanisms underlying nutrient dynamics . . . will be paramount in increasing crop yields'. This is a tall order, and the book provides little help as regards applying fertilizers: nevertheless it is one which crop nutritionists should have on their shelves.

Alan Scaife

Integrating Biodiversity in Agricultural Intensification: Towards Sound Practices. By J. P. Srivastava, N. J. H. Smith and D. A. Forno. Washington DC: The World Bank† (1999), pp. 41, US\$22.00. ISBN 0-8213-4263-0.

Preservation of biodiversity has become an emotive as well as a practical issue as agricultural expansion and intensification cause major changes to the flora and fauna, particularly in the developing countries with their rich but often poorly defined diversity. On the other hand, agricultural intensification is essential to meet the food needs of the world. National and international institutions have introduced extensive programmes of genetic conservation of the major food crops but only a tiny proportion of the world's half million species has been screened for its economic potential; it is the loss of potentially useful crops among these species which raises most concern.

As the leading agency in development, the World Bank must promote policies which support the needs of farmers and the long term necessity to conserve the tropical world's biodiversity. This publication suggests ways to reconcile these policies by discussing practical methods by which the environmental impacts of agriculture can be mitigated. It sets out the Bank's role in policies and investments to achieve these objectives by sound practices at the farm, community and landscape levels and illustrates these by selection of case studies from Asia and Africa. It is a useful contribution to the solutions for a complex situation.

John Coulter

The Genetics and Exploitation of Heterosis in Crops. Edited by J. G. Coors and S. Pandey. Madison: American Society of Agronomy, Inc. and Crop Science Society of America Inc. (1999), pp. 524, no price quoted. ISBN 0-89118-549-6.

In 1950 a meeting was held in Ames, USA, to review the state of knowledge on heterosis, particularly in maize. The present book is based on its successor held at CIMMYT, Mexico, in 1997 and explores, in 48 chapters, the progress made since then.

It had more participants, lasted less time and covered more crops than in 1950, but what new do we learn about heterosis? Precious little it seems! Overdominance is out, as indeed some geneticists, who were not represented at the meeting, had always argued. Thus 3- and 4-way crosses are no longer needed and current inbreds exceed past hybrids.

So what is left? Linkage, mutation and epistasis. Tight repulsion linkage has always been accepted as a major factor. Mutation rates are now known to be higher and their potential contribution is well noted. Several contributors try to underplay the role of epistasis, largely because it has little effect on genetic variance! Since when have hybrids been profitable on the basis of genetic variance? It is their mean and stability that are crucial and the literature has plenty of evidence of epistasis for these.

Question: If there is no overdominance, shouldn't hybrid breeding strategies be critically reassessed, or do we wait for 2050?

M. J. Kearsey

Grass, its Production and Utilization. (Third Edition.) Edited by A. Hopkins. Oxford: Published for the British Grassland Society by Blackwell Science (2000), pp. 456, £35.00. ISBN 0-632-050179.

This edition has been rewritten and greatly expanded to cover advances in grassland science, as well as new fields of interest in pasture management and use. It has fifteen chapters (the second edition

†Pricing of publications by The World Bank. The World Bank has agreements with sole distributors in most countries. The prices quoted in US\$ are for the USA. For UK prices it is necessary to consult the UK agent, Microinfo Ltd, PO Box 3, Alton, Hants, UK.

had seven) by a team of twenty-three specialists. Subjects are dealt with in logical sequence: chapters on Sward Establishment and Principles of Pasture Growth precede those on Herbage Production. Three chapters on Feeding Value, Conservation, and Principles of Foraging and Grazing Behaviour come before Grassland Management under Grazing. Economic Aspects form the final chapter. Seed Production and Weed Control are dealt with separately. A wider approach to grassland is shown by strong chapters on Amenity Grassland, Control and Utilisation of Livestock Manures, and the Role of Grassland in Organic Farming; there is also a chapter on Grassland Management for Natural Landscapes and Wildlife. The emphasis is on temperate, sown pastures in maritime climates, especially ryegrass in Great Britain, although natural pasture is discussed. The book is, however, of interest to a far wider readership for its clear and concise discussion of the principles underlying pasture cultivation, growth and use, as well as its introduction of grassland in organic farming.

J. M. Suttie

Cotton Fibers. By A. S. Basra. Binghamton, NY, USA: The Haworth Press (1999), pp. 387, US\$89.95. ISBN 1-56-22-867-9.

The first half of this book covers the biology of fibre development, essential reading for biotechnology scientists and genetic engineers involved in fibre improvement. Much is now known on the principles of fibre development and the most recent work is covered thoroughly.

The second half of the book will be of more interest to crop specialists, especially breeders. There is analysis of the relation between farm yield and the demands of textile producers for better fibre. Breeders must understand, therefore, which characters will be important in the future: length and strength are moderately heritable and continued improvements are expected, but short fibre content reduction, better length uniformity and finer fibre are demanded increasingly.

Genetic engineering has produced pest- and herbicide-resistant varieties and now isolation of genes controlling fibre development proceeds rapidly. This is crucial to design biotechnological methods for breeding for fibre quality – but the technology is complex and short term benefits are unlikely.

The final chapters review ginning and textiles. The book therefore covers many topics and should encourage dialogue and understanding between growers, crop scientists, processors and the emergent biotechnologists. Such dialogue is essential for quality improvements to continue and to ensure that cotton retains its eminent position as a textile fibre.

J. S. Watson

Paying for Agricultural Productivity. Edited by J. M. Alston, P. G. Pardey and V. H. Smith. Baltimore & London: Johns Hopkins University Press, published for the International Food Policy Research Institute (1999), pp. 314, paperback £17.00, hardback £45.00. ISBN (paperback) 0-8018-6278-7. ISBN (hardback) 0-8018-6185-3.

The book seeks to document the changes in the funding mechanisms and institutional orientation of public agricultural research, and the incentives affecting private R&D, in Australia, the Netherlands, New Zealand, the United Kingdom and the United States over the period 1970 to the mid-1990s.

The book is well researched, well referenced and contains a useful index. It will be valuable documentation for its primary audience of policy makers and administrators responsible for agricultural research and extension in state and national governments and in international agencies. The economic language used in parts will limit its value to the wider audience claimed; (p. 5) ‘farmers, food processors, wholesalers, retailers, environmentalists, scientists and all who have a direct stake in or are affected by the research system’.

Its success is the well organized documentation of the changes in these five developed countries and the analysis of their causes. The authors hope ... ‘to draw some general lessons for countries

seeking to improve their agricultural research systems in the face of tighter resources and changing public perceptions and expectations' is not fully realized. The six page 'synthesis' draws conclusions at a very general level. The reduction in public funding over this period, or for some case countries its slower growth, has been paralleled by a widening of the agricultural research agenda in food safety and human nutrition, and by embracing the impact of agriculture on the environment. It was precipitated by the dominance of market driven governments over this period with new perceptions of the roles of the public and private sectors in research. It is unclear how relevant the conclusions are to the different and diverse circumstances of the developing world. An ever present danger is the international community applying them uncritically through their aid programmes.

M. Collinson

The Exploitation of Plant Genetic Information. Political Strategies in Crop Development. By R. Pistorius and J. van Wijk. Wallingford, UK: CABI Publishing (1999), pp. 231, £40.00. ISBN 0-85199-363X.

The authors of this book are academics working in political science and business administration respectively in the Netherlands. Their declared intent is to provide a synthesis of issues transcending the disciplinary boundaries within which discussion of the subject has hitherto been largely confined. In the authors' view, the principal determinant of attitudes to the exploitation of plant genetic information is the industrialization of agriculture and its effect on crop development. Taking a broad historical sweep and using case studies of Chile and Colombia, they demonstrate that such attitudes can vary *within* national boundaries as well as between them.

Three main phases in crop development from the 1870s to the present are identified and labelled, somewhat portentously, as Agro-Food Orders, characterized respectively by initial state support for agricultural research in industrialized countries, progressing the state-led industrialization of agriculture and thence to what they perceive as the contemporary market-led industrialization of agriculture. The argument is novel and has the merit of distancing the discussion from the political polarization which has previously tainted it.

There is a wealth of information in this book, especially on the evolution of legislation for protecting plant genetic resources, with convenient summaries at the end of each section and some fascinating footnotes. A few errors and quaint historical interpretations can be found in the text but anyone coming fresh to this subject will find this book a valuable source of reference.

G. Jenkins

Intellectual Property Rights in Agriculture. Edited by U. Lele, W. Lesser and G. Horstkotte-Wesseler. Washington, DC: The World Bank (1999), pp. 87, US\$22.00. ISBN 0-8213-4496-X.

Can you remember the happy days when plant breeding made good progress without benefit from Intellectual Property Rights (IPR)? But now, in order to encourage private enterprise to increase investment in crop improvement, especially using the expensive tools of biotechnology, IPR have been developed in various ways and to various extents in different countries. The issues are important and the legal complexities are considerable.

Some of us who have found ourselves involved feel rather like reluctant players in a game we do not like but are obliged to play: the rules vary as the game progresses and also in different parts of the field; and the players and spectators argue about their interpretation. Emotions run high: some spectators suspect that the rules are devised as a neo-imperialist plot to give unfair advantage to teams supported by multinationals who, they claim, would like to patent life itself, whereas others think the practical realities of financing the technological progress needed to feed the world is being hampered by reactionary romantics.

Nobody can enjoy playing this game, or even watching it, but if you are reading this review you probably have to. In which case read the book. It describes the main problems and possible ways forward, and some mind-focusing case studies – including collaborations between industry and

publicly funded institutes, as well as the rows over the patenting of basmati rice and the extraction of active components from the neem tree.

This book may affect you in a similar way to the management teaching on undergraduate students claimed by my late colleague, John Pearce, who said: 'They arrive in a confused state and when they leave they are still confused, but at a much higher level'.

Eric Roberts

Wheat: Ecology and Physiology of Yield Determination. Edited by E. H. Satorre and G. A. Slafer. New York: Food Products Press (1999), pp. 503, US\$125.00. ISBN 1-56022-874-1.

This multi-authored book of 19 chapters is in four sections: physiology; ecology; production systems; and breeding to further raise yield. Despite 'physiology' in the title, there is little coverage of this subject in any of the chapters, though a good coverage of development, including the responses to photoperiod and vernalization, and yield components. The section on 'ecology' is somewhat lacking in coherence, covering the diverse topics of the effects of sowing date, plant density, weeds, pests and diseases. The chapters on pests and diseases deal with these organisms in a general way and do not consider individual pests and pathogens, their biology, and their effects on the crop or genetic resistance. The production systems covered are: the Great Plains of the USA, Australia, Mediterranean environments and the Pampas of Argentina. Thus, important wheat production areas (temperate Europe, Russia, India and China) are not considered. Four chapters cover the prospects for breeding higher yielding cultivars. Of these chapters, that by Slafer, Araus and Richards is the most interesting and informative.

The book is well produced and has comprehensive subject and author indices and, after each of the chapters, a list of references. The book will be of interest to students of wheat science.

R. B. Austin

Management of Nitrogen and Water in Potato Production. Edited by A. J. Haverkort and D. K. L. MacKerron. Wageningen, The Netherlands: Wageningen Pers. (2000), pp. 353, NLG 110. ISBN 90-74134-77-7 paperback.

High levels of nitrogen application are frequently justified, for the potato crop, while it is particularly sensitive to water stress. Due to pressure on water supplies and to pollution associated with excessive nitrogen use, there are powerful reasons for using both resources with maximum efficiency.

The book is divided into seven sections. An introduction deals with general principles. There follow chapters on plant nitrogen status; soil nitrogen status; plant and soil water status; nitrogen and water decision support systems; future developments, recommendations and trends in research and practice. There are summaries in ten languages.

The editors have taken considerable trouble to produce a text, from 28 contributors, which is sound in scientific principles yet accessible to the practitioner. Each section begins with a series of pertinent questions and ends with conclusions and recommendations. The text is not a traditional academic treatise whereby every statement is backed by references, but contains sufficient to avoid being merely assertive. Simulation and other modelling approaches are elegantly explained and the case for their use in decision making is well made, as is that for developing self-learning systems by co-operation between producers, consumers and scientists, an approach applicable to all branches of agriculture.

While specifically applied to Europe, the principles and practical means of putting principles into practice are universally relevant. The book is an important addition to the agricultural literature and should not gather dust on the office or library shelf.

Paul Harris

The Formative Years of Plant Pathology in the United States. By C. L. Campbell, P. D. Peterson and C. S. Griffith. St Paul, MN, USA: APS Press (1999), pp. 427, US\$49.00. ISBN 0-89054023303.

This book provides a very readable analysis of the factors, personalities and institutions that catalyzed the development of plant pathology in the USA. Rather than being a mere catalogue of events, names and places, it illustrates how some of the challenges posed by developing agriculture were met by the emerging scientific community in the North American continent. The book's 12 chapters are grouped into four parts covering plant diseases and agriculture in early America, the origins of plant pathology in the USA, the rise of plant disease research, and the maturation and professionalization of plant pathology. These chart the progress made from the early recognition of problems posed by wheat rusts and fire blight in the early eighteenth century to the establishment of the American Phytopathology Society at the end of 1908 and the first issue of *Phytopathology* in 1911. While containing much well researched detail, the book also provides a broader view of experimental agriculture during this period, demonstrating the seemingly perennial nature of problems associated with funding, the balance of basic and applied research and institutional politics! Despite its concentration on the United States perspective, this book will appeal to all those interested in the history of science and in the development of plant pathology as a discipline.

J. M. Waller

Lettuce, Endive and Chicory. By E. J. Ryder. Wallingford, UK: CABI Publishing (1999), pp. 208, £27.50. ISBN 0-85199-285-4.

This book is a recent addition to the 'Crop Production Science in Horticulture Series'. It is designed to inform the reader of the scientific principles that support production practices for the three salad crops, and has achieved that purpose quite well. The author has spent more than 40 years as a lettuce breeder and geneticist in the Salinas Valley, the heart of the largest lettuce-producing region in the world. He thus brings an enormous wealth of experience to this volume, that is particularly evident in his chapters on Genetics and Breeding, and Disease Management. The chapters on Production Methods, Harvest and Postharvest Methods, and Seed Production and Marketing also reflect the author's experience in the Western United States, and give the reader a succinct summary not available in other publications. Most of the book is devoted to lettuce, with only short mentions of endive and chicory. This is a reflection of the relative dearth of literature for the latter crops, and their smaller production volume. The book is written in a generally clear and interesting manner, with the exception of the section on seed germination, where explanations of the influences of temperature and light quality still leave the interested horticulturist bewildered.

Chris Wien

Agriculture, Fertilizers and the Environment. By M. Læg Reid, O. C. Bøckman and O. Kaarstad. Wallingford, UK: CABI Publishing in association with Norsk Hydro ASA. (1999), pp. 292, £22.50. ISBN 0-85199-385-3.

This book attempts to place the need for fertilizers to increase and sustain food production while ensuring adequate protection of the environment, firmly in the context of a proper understanding of the scientific background of the problem. In the preface it is stated that the target audience is 'anybody with an interest in agriculture and the environment, although some familiarity with science and environmental topics would facilitate comprehension'. This sets the authors a considerable challenge because, as they frequently point out, the science is often quite complex, especially when the intention is to relate the problems to many different environments in all parts of the world. Most soil scientists reading the book will find many statements in the first five chapters with which they disagree, whereas environmentalists will mostly disagree with the comments and conclusions in the last three chapters. However, many agriculturists and economists

will find much useful information, and recognize the strength of the case which is made for ensuring that fertilizers are used judiciously and effectively to ensure sustainable and adequate production of food in all parts of the world. The sustainability of food production and its relation to environmental problems is a topic of immense importance. This book is needed, but it is hoped that a book with a stronger scientific base, and a better balance of the treatment of the needs for water and nutrients, may soon be written.

D. J. Greenland

Advances in Hemp Research. Edited by P. Ranalli. Binghamton, NY, USA: Food Products Press (1999), pp. 272, US\$69.95. ISBN 1-56022-872-5.

No one can give a date when and why man started to use hemp. Were the plants used as a source of food and applications for its fibres realized later or was it *vice versa*? How were its psychoactive characteristics recognized and were they originally used for medicinal purposes? Hemp was one of the earliest of the cultivated crops and its importance continued until relatively recently.

Its demise, along with that of flax, coincided with the development of cotton and man-made fibres. The narcotic issue was a further factor, although we can speculate the fate of tobacco if it had not become a major source of tax revenue in many countries. However, the development of essentially narcotic-free cultivars and the need for more environmentally acceptable plant fibres has renewed interest in hemp as a crop.

This book has pulled together effectively into a single volume all the relevant and recent research on hemp, from chapters devoted to the botany, agronomy and physiology through both conventional and biotechnological aspects of genetic improvements. The control of diseases is fully covered, as well as the phytochemistry of the plant, including the narcotic content, and the pulping of the fibres for the pulp and paper industry. For anyone wanting to use this '(re)new(able)' crop, this book will be essential reading.

I. M. Morrison

The Living Land. By J. Pretty. London: Earthscan Publications Ltd (2000), pp. 304, £12.99. ISBN 1-85383-516-1.

This is a good book: it is well researched, strong on analysis and creative in the vision that it portrays for the future. Importantly the book deals with underlying concepts and principles; it provides a basis for analysing different approaches to land use and management. It sets a context in which the reader can come to an understanding of the implications of following alternative land use strategies and the extent to which they meet the economic, environmental and social objectives of societies that wish to embrace the concept of sustainable development.

Its strength lies in its comprehensive reviews, with facts and figures wherever possible, of how we have arrived at where we are in terms of land use in Europe; the impact of technological development in agriculture on food production and the potential for developing a more sustainable agriculture; the impact of land use and food policies in developed countries on global food supplies and the economies of developing countries, and the potential for creating a more sustainable global food system; the impacts of European agricultural and land use policies of the last forty years on rural communities and the potential for making a difference by placing the environment and people at the heart of CAP reform, and the new policies for the twenty-first century. This is an excellent text for students as well as for those working professionally within the land use sector.

T. J. Maxwell

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

Expanding the Frontiers of Irrigation Management Research. Results of Research and Development at IIMI 1984 to 1995. By D. J. Merry. Colombo, Sri Lanka: International Irrigation Management Institute (1997), pp. 228, US\$30.00 (developing countries US\$13.00). ISBN 92-9090-346-5.

SEWANA (South Europe, West Asia and North Africa) Durum Research Network. Edited by M. M. Nachit, M. Baum, E. Porceddu, P. Monneveux and E. Picard. Aleppo, Syria: ICARDA (1998), pp. 334, HIC US\$35.00, LIC US\$20.00. ISBN 92-9127-074-1.

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