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BOOK REVIEWS

Diagnostic Procedures for Crop N Management. Edited by G. Lemaire and I. G. Burns. Paris: INRA (1997), pp. 158, FF 100.00. ISBN 2-7380-0757-0.

This book contains the proceedings of an Anglo–French Workshop held at Poitiers in 1995, with 14 papers (unfortunately lacking abstracts) covering the four subject areas: defining the critical whole-plant total N% for different stages of growth; simulation models, sometimes combined with field diagnostic tests; nitrate behaviour in forage crops; and aspects of nitrogen in crops and soils, some of which do not fall within the remit of the workshop title.

It is difficult to see why whole-plant N% is being targeted as a diagnostic criterion, in view of the large volume of material to be sampled in practice, and the need to estimate crop biomass to establish the critical N%. In the past, a particular leaf (for example, the 'youngest fully expanded') was sampled on the assumption that its critical nutrient concentration would remain constant during crop growth. Very few papers refer to the application of these techniques on real farms, or to the particularly difficult agronomic problem of proving with sufficient precision that they can guide the farmer in making small adjustments to his N applications.

A. Scaife

Farm. A Year in the Life of an American Farmer. By R. Rhodes. Lincoln, Nebraska, USA: University of Nebraska Press (1998), pp. 336, £15.95. ISBN 0-8032-8965-0.

The experiences of an American farmer are closely followed throughout a farming year. The author, Richard Rhodes, spent a year living and working on a mixed family farm in Missouri, USA. He has adopted pseudonyms for the characters but events and dialogue are apparently authentic and are recounted in a very readable fly-on-the-wall style. The author is perceptive and the text clearly conveys his understanding of the people he encountered and the situations he experienced. The concerns of the farmer, ranging from technical day-to-day matters to more strategic issues, are presented sagaciously. This book has broad appeal. The author has succeeded in striking a balance – while he details a reasonable amount of technical information there is not so much as to overwhelm an unfamiliar reader. Readers, whatever their degree of technical understanding, will enjoy the characters and the insights they offer into rural values and a rural way of life.

Adam Anderson

Land Resources: on the Edge of a Malthusian Precipice? Edited by D. J. Greenland, P. J. Gregory and P. H. Nye. Wallingford, UK: CAB INTERNATIONAL/The Royal Society (1998), pp. 180, £40.00. ISBN 0-85199-235-8.

These proceedings of a scientific meeting held in December 1996 have already been published (*Proceedings of the Royal Society B*, 252 (1997)), but are gathered here with an added introduction that gives a summary of the meeting and a list of conclusions. The theme is the balance sheet between growth in human population and growth in food production. The subtitle 'on the edge of a

Malthusian precipice?' attracts attention, but also demands scrutiny since it implies that the world population is about to collapse because land can no longer supply enough food. Informed opinion has considered this question many times in the 200 years since Malthus, and is likely to continue to do so for at least as long into the future, barring global catastrophe. Anyone looking for a succinct and definitive answer to the subtitle's question will not find it. Rather the 14 chapters of the present volume condense a large part of our knowledge on the nature of land and soil resources, on population demography in relation to food supply, and on the limitations to crop production, especially in the tropics; as such, it is a testament to the successful fusion of environmental science and biology and to the internationalization of data in this field. The approach is highly quantitative, generally very well researched and presented and, individually or as a whole, the chapters will make excellent reading and source material for those attracted to the subject from a range of disciplines. An arguable deficiency is that the list of prescriptions – though commendable in itself – has been widely appreciated and accepted for several decades. The introduction could have made more of the opportunity to define in both physical and biological terms what is an acceptable stability in soil structure and microbial function, and at what scale and with what parameters it needs to be monitored and researched: a very useful volume nevertheless.

G. Squire

Temperate Forage Legumes. By J. Frame, J. F. L. Charlton and A. S. Laidlaw. Wallingford, UK: CAB INTERNATIONAL (1998), pp. 327, £27.50. ISBN 0-85199-2145.

Three temperate forage legumes, white and red clovers *Trifolium repeus* and *T. pratense* and lucerne *Medicago sativa*, are dealt with in detail; eight others are treated briefly: subterranean clover *T. subterraneum*, birdsfoot trefoil *Lotus corniculatus*, greater lotus *L. uliginosus*, alsike clover *T. hybridum*, sainfoin *Onobrychis viciifolia*, seradella *Ornithopus sativus*, sulla *Hedysarum coronarium* and tagasaste *Chamaecytisus palmensis*. Their growth, development, physiology, nitrogen fixation, agronomy, management, utilization, herbage quality and animal productivity are discussed; adaptation to soil and climate is only touched on. The text is concise and easily read. 'Temperate' is not defined but the emphasis is on mild humid climates and modern anglophone farming systems; the full range of legumes grown outwith the sub-tropics is not covered. Subterranean clover is included, the annual medicagos widely grown in similar climates but on neutral to alkaline soils are omitted, tagasaste is a little grown crop for Mediterranean conditions. Temperate developing countries are not discussed, although lucerne, sainfoin and some clovers (*Trifolium. resupinatum* notably and *T. alexandrinum* in areas of mild winters) are important in western and central Asia. This is a useful and welcome book for workers on its main crops even if the title may mislead.

J. M. Suttie

Crops for Industry and Energy in Europe. By N. O. Smith, I. Maclean, F. Miller and S. P. Carruthers. Brussels: European Commission DG XII (1997), pp. 72, ECU15. ISBN 92-827-9415-6.

This book published by the European Commission DG XII illustrates the different crops currently available throughout Europe which could be grown as sources of renewable raw material for industrial purposes. The publication is clearly laid out and well presented in order of Botanical family. Over 40 potential crops are included, each described in a one page summary. The summaries are well written and clearly provide useful information and further sources of reading on each crop. Photographs of exceptionally high quality illustrate what the crop looks like at varying growth stages.

The inclusion of economic data would perhaps have been useful to indicate the potential financial viability of the crops. However, this omission is justified as it prevents the publication becoming dated in a rapidly moving subject area. Agronomic and maturity data tend to relate primarily to English growing conditions and may be less accurate for crops grown in the very north and very

south of Europe. That aside, this is an excellent publication which should be on the bookshelves of all those interested in novel and non-food crops.

Kerr C. Walker

Agroforestry for Soil Management. (*Second Edition*.) By A. Young. Wallingford, UK: CAB INTERNATIONAL (1997), pp. 320, £25.00. ISBN 0-85199189-0.

This book is an expansion and a re-titling of the 1989 book by the same author. The scientific underpinning of agroforestry was then very weak, and many claims were untested. This book aims to bring the subject up to date, using recent research results, and giving many recent references.

This is a laudable aim, and the book is a valuable introduction, but agroforestry needs more hard science. Here there are too many general statements, and too little quantitative information and detailed process science. The managerial problems of growing species together are little mentioned, except for the conflicting demands for labour. The book discusses fairly the many failures of introduced agroforestry systems caused by management problems, the uncertainty of the benefits of such systems and also the failures in early experimental approaches.

The book properly stresses the use of agroforestry in soil conservation and management. Contour hedgerows and surface covers can control erosion, and trees can contribute strongly to nutrient cycling. However, trees compete with crops, and the net result is therefore difficult to predict, and will vary with site and year. As in all complex systems, the devil is in the detail, and the detail is only gradually becoming understood. The book probably understates the difficulty of this research.

Bernard Tinker

Oryza: from Molecule to Plant. By T. Sasaki and G. Moore. Dordrecht: Kluwer Academic Publishers (1997), pp. 254, £90.00. ISBN 0-7923-44553.

Overall the content of this volume is excellent and will be of relevance to cereal breeders, geneticists and biotechnologists. In addition, it provides a good overview of current activities in cereal genomics and its relevance to the agricultural community. The volume is a reprint from *Plant Molecular Biology* (1997) Volume 35 (1–2) and is composed of 23 chapters, providing a comprehensive account of the contemporary genetics of rice. An important message emerging from this volume is that rice provides not only a staple food crop but a model organism for other cereal species such as wheat and maize. Devos and Gale (pp. 3–15) provide an excellent overview of the comparative genetics of grass species, demonstrating synteny (conservation of gene order and content) between different species within the grass family. This theme is reinforced by Moore *et al*. who pose the question: 'Are rice chromosomes components of a holocentric chromosome ancestor?'

Other chapters focus on the origin and cultivation of rice (Khush), alien gene introgression (Brar and Khush), genetic resources (Jackson), genetic mapping (Nagamura *et al*.) and microsatellite development and deployment (McCouch *et al*.). Key technologies for genomics research are also described. These include physical mapping of the rice genome and bacterial artificial chromosomes (BACs) and yeast artificial chromosomes (YACs), together with large-scale expressed sequence tags (EST) sequencing. Technologies for genetic transformation and transposon tagging are also described in detail. The final chapter by Cartinhour provides an important insight into the need for an informatics infrastructure to allow rapid access to the vast array of rapidly emerging data.

With a volume of this nature some duplication of information is inevitable. Overall, the editors have succeeded in producing a comprehensive text which includes an intelligent review of rice genomics technology. The readership in my opinion will therefore be impressed with the potential of rapidly relating phenotype to genotype and eventually the gene. However, a significant challenge

which is not addressed in this book relates to the synthesis of this technology into a rice improvement programme.

W. Powell

Sustainability, Growth, and Poverty Alleviation. A Policy and Agroecological Perspective. Edited by S. A. Vosti and T. Reardon. Baltimore, MD, USA: Johns Hopkins University Press (1997), pp. 407, £45.50. ISBN 0-8018-5607-8.

Debates concerning sustainability in developing countries often focus on the activities of regional or national institutional structures and the relationship between developing and developed countries. Such debates often overlook the key roles played in the exploitation of natural resources by stakeholders at the individual householder, farmstead and local community levels, where food security and short-term survival strategies often predominate to the detriment of the immediate environment and longer-term sustainability.

In this book, the authors have drawn together several contributions to bridge this gap and explore the inter-relationships between the demand for additional food production, poverty and the environment. Part I explores concepts, definitions, indicators and the links in this relationship for the agro-ecological zones of Africa, Asia and Latin America, which are home for the vast majority of the poor of the world. Part II provides the reader with several case studies which examine the nature of these links in the context of policy implementation, technology and socio-economic structures at regional, local and the individual stakeholder levels.

This is essential reading for policy makers in both developing and developed countries and is a valuable resource for researchers, graduates and advanced graduates interested in addressing human development and resource management today and for future generations.

Richard Baines