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BOOK REVIEWS

Septoria on Cereals: A Study of Pathosystems. Edited by J. A. Lucas, P. Bowyer and H. M. Anderson. Wallingford, UK: CAB INTERNATIONAL (1999), pp. 368, £55. ISBN 0-85199-269-2.

This book contains the proceedings from the Fifteenth Long Ashton International Symposium, September 1997. It covers diverse topics from molecular biology and population biology through to fungicidal control and breeding for resistance. Whilst it is likely, therefore, that most readers will consult only one of the sections, it is valuable, nevertheless, to have genetics and population dynamics (Part one), host–pathogen interactions (Part two) and disease management and decision support (Part three) in one book, especially for researchers new to these pathogens. It is useful also to have the two major pathogens, *Mycosphaerella graminicola* (anamorph *Septoria tritici*) and *Phaeosphaeria nodorum* (anamorph *Stagonospora nodorum* or formerly *Septoria nodorum*), compared and contrasted. Also contained within the book is a comparison with other necrotrophic cereal pathogen interactions, namely *Rhynchosporium secalis*, *Magnaporthe grisea* and *Pyrenophora* species. These are all economically important diseases, so the inclusion of various aspects of disease management with basic epidemiology, fungicide discovery and resistance breeding, linked by papers on integrated management (including use of tools such as decision support systems), is appropriate. Pre-publication and anecdotal data are included in several papers making them a valuable syntheses of current thinking. The comprehensive nature of this book makes it a valuable asset to anyone working on necrotrophic pathogens of cereals.

A. C. Newton

Financing Agricultural Research: A Sourcebook. Edited by S. R. Tabor, W. Janssen and H. Bruneau. The Hague, The Netherlands: The International Service for National Agricultural Research (ISNAR) (1998), pp. 363, no price quoted. ISBN 92-9118-035-1.

This book is a response to the issue of funding agricultural research, deepened to crisis through a coincidence of factors surrounding poor industrial performance in developing countries and a renewed dominance of market thinking in the international community. It is compiled, edited and published by ISNAR to assist policy makers and research managers in the developing world. The book is in four parts and there are 20 distinguished contributors in addition to three editors, who themselves make major contributions to the text.

Part 1: Finance Policy for Agricultural Research, 132 pages, and Part 2: Resource Mobilization and Accountability, also 132 pages, make up the bulk of the text, with Part 3: Financial Management, 30 pages, and Part 4: Trends in Agricultural Research Funding, 56 pages. It is not obvious why Part 4, titled to suggest a description of the problem, is not the first in the book. It includes separate contributions on Africa, Latin America and Asia. A shortcoming, and perhaps the reason why the topic is at the end of the book, is that most of the supporting data on trends finish in 1992.

As a response to the research funding issue, which started in the late 1980s, the book might be seen as late. Its timing, however, brings the advantage of tapping experience at national, local and regional levels following the fall-off in both government and donor support for public research budgets. It is the vignettes on new organizational, institutional and financial arrangements which offer some of the book's best insights. However, it is a weightier volume than its vignettes; early contributions in Part 1 bring economic and fiscal history to bear on research policy and most of the other contributions draw on relevant operational experience. Despite the old data, the book is a

compendium of current thinking and experience on the agricultural research funding issue which will be valuable to its target audience of policy makers and research managers.

M. Collinson

Cover Crops in Hillside Agriculture, Farmer Innovation with Mucuna. By D. Buckles, B. Triomphe and G. Sain. Ottawa: International Development Research Centre and Mexico DF: International Maize and Wheat Improvement Centre (1998), pp. 218, no price quoted. ISBN 0-88936-841-4.

In northern Honduras land scarcity forces small maize farmers to cultivate steep land; bush fallow no longer maintains fertility nor controls weeds. Over the past twenty years farmers have introduced from similar areas in southern Mexico and Guatemala, a no-till maize production system, *abonero*, based on a velvet bean (*Mucuna pruriens*) self-reseeding fallow which improves fertility, protects the soil, controls weeds and reduces labour costs. The introduction took place without the intervention of extension services. The majority of households use the system but sharecroppers do not. One crop of local maize is grown under *abonero* which produces a greater yield than the traditional two crops, with no bush fallow period. The green manure is slashed after seeding but the stover and haulms are not used as forage nor are the pods harvested; maize is dibbled through the mulch; some pruning of the bean may be needed but weeds are suppressed. The northern area of Honduras has an annual rainfall of 3000 mm and a growing season of over 270 days; soils are deep and relatively rich. *Abonero* does not suit the drier south of the country. The *abonero* system, its agro-ecology and economics are described in detail; it appears to succeed in maintaining annual crops on land which has a slope of over 20%, and would be better under tree crops or forest.

J. M. Suttie

Resource Management in Rice Systems: Nutrients. Edited by V. Balasubramanian, J. K. Ladha and G. L. Denning. Dordrecht, The Netherlands: Kluwer Academic Publishers (1999), pp. 355. £102.00. ISBN 0-7923-5199-1.

This volume contains 23 papers presented originally at a workshop at Bogor, Indonesia in December 1996 to explore the nutrient management issues involved in intensifying rice production. Ten of the papers have been published simultaneously in the refereed journal *Nutrient Cycling in Agroecosystems*. The book is divided into three sections with papers on both irrigated and rainfed, lowland rice and rainfed, upland rice. Part 1 examines nutrient management strategies and options in various rice production systems and this leads to considerations of farmer opportunities for, and constraints to, adoption. Finally, almost half of the papers are devoted to approaches for evaluation of new technologies and their promotion to farmers. A paper by Kundu and Ladha sets out the issues and options for sustaining the productivity of soils producing lowland rice with respect to nitrogen, and outlines the reasons why the nitrogen-supplying capacity declines with time, even when total soil nitrogen remains constant or increases; this is an important issue. Several papers stress the need to encourage farmers to move from higher use of inputs (especially nitrogen fertilizer) to increased efficiency of the inputs used. There is a continuing need for new innovations that may benefit farmers as they intensify production and this book usefully summarizes current knowledge.

P. J. Gregory

Sustainability of Rice in the Global Food System. Edited by N. G. Dowling, S. M. Greenfield and K. S. Fischer. Davis, California: Pacific Basin Study Centre, and Manila, The Philippines: International Rice Research Institute (1998), pp. 404, HDC US\$32.75; LDC US\$8.75. ISBN 971-22-107-4.

This book summarizes papers from a World Wide Web-based conference on issues facing the sustainability of rice agriculture in the next century. The problem is daunting – to keep pace with

population growth, rice production must increase by 60% by the year 2020. This represents an increase in crop yields of 3% per year, an unsustainable target, particularly as it has to be achieved with less water, less labour, and less land, without adversely affecting the environment, and against a backdrop of declining funding for agricultural research. A tall order?

Fortunately, rice scientists do have some cards up their sleeves. Current research at IRRI is focusing on new plant-types, hybrid rice, and improved production from rainfed rice, which are expected to give 20%, 15% and 20% increases in production respectively; whether these increases are additive remains to be seen. Other longer-term 'New Frontier' projects are investigating nitrogen fixation, apomixis and perenniality in rice. Ways in which future rice production interacts with the environmental and economic systems are also discussed.

The book concludes by summarizing key research areas, both on global implications of rice production, and on increasing rice productivity. A fascinating and thought-provoking book, and one that should be required reading for all bureaucrats who are considering the next round of cuts in funding for agricultural research.

R. B. Matthews

Allelopathy in Rice. Edited by M. Oloffsdotter. Manila, The Philippines: International Rice Research Institute (1998), pp. 154, HDC US\$15.50, LDC US\$4.00. ISBN 971-22-0101-5.

This book contains the proceedings of a workshop held in 1996. It brought together scientists from around the world who had been working on a subject on which there is considerable speculation due to a scarcity of clear results. Of the processes involved in competition between plants, little is known of those occurring below ground, and in particular those related to the release of chemicals. Subjects addressed ranged from sources of allelopathic activity for use in plant breeding, the use of bioassays, the nature of allelochemicals and the possible role of allelopathy in weed management strategies. Allelopathic potential has been found in 3.4% of rice germplasm, though activity against one weed species does not necessarily indicate activity against another. Rice varieties have been identified with activity against important weeds including *Echinochloa crusgalli*, one of the world's worst weeds of rice. Screening methodologies are described which permit the identification of allelopathic activity earlier in the breeding process, and issues relating to the applicability of laboratory results are discussed. An interesting addition would have been a summary of discussions that followed the papers, but its absence does not detract from this valuable reference which reflects the 'state of the art' on a difficult subject.

D. E. Johnson

Genetic Engineering, Food and our Environment. Edited by L. Anderson. Totnes, Devon, UK: Green Books (1999), pp. 160, £3.95. ISBN 1-870098-78-1.

As with most, if not all, new technologies, genetic engineering has disadvantages as well as advantages. It is the discussion of these that is the basis of the current controversy which is becoming increasingly polarized. What is needed for 'the public' to make informed decisions on this subject are balanced presentations of both sides of the argument. Unfortunately, these are rare and this book, which focuses on perceived, but mainly not proven, problems of genetic engineering, does not help the general reader to reach an informed conclusion.

The aim of the book is to be a brief guide highlighting many of the issues relating to the human, political and environmental implications of genetic engineering in food and agriculture. It starts with a chapter on the basis of genetic engineering, followed by chapters on genetic engineering and the environment and farming, the regulatory control of releases and on intellectual property right issues. I found the style hectoring, presenting one horror scenario after another, and the author does not compare the potential risks of this technology with those of the present and predicted future of non-transgenic food production. The text is amply supplied with references to sources of the

'information' presented. In a section on 'Resources' contact points are given to organizations and web sites which mainly campaign against this technology.

This book is a useful compendium of quotations against genetic engineering but, in my view, does not contribute to the public discussion.

Roger Hull

Climate Change and the Global Harvest. By C. Rosenzweig and D. Hillel. Oxford: Oxford University Press (1998), pp. 324, £49.50. ISBN 0-19-508889-1.

This book gives an excellent comprehensive review of the current knowledge on man's effect on greenhouse gases and the resulting predicted changes in climate. Current research on computer modelling, deficiencies in knowledge of processes such as the oceans' effect on gas fluxes and effects on temperature control are dealt with. The computer-predicted climate changes are used to derive possible effects depending on location. Technical developments in agriculture, economic and social changes, and population increases are taken into account in forecasting future world food sufficiency. Attempts are made throughout the book to suggest ways of mitigating the adverse effects of change.

Chapter headings show the subject material covered: the greenhouse effect and global warming; agricultural emissions of greenhouse gases; carbon dioxide, climate change and crop yields; effects on weeds, insects and diseases; the role of soil resources; water resources and sea-level rise; analysis of climate change impacts; regions at risk; global assessment and future food security; adaptation, economics and policy.

J. C. Holmes

Root Demographics and their Efficiencies in Sustainable Agriculture, Grasslands and Forest Ecosystems. Edited by J. E. Box Jr. Dordrecht, The Netherlands: Kluwer Academic Publishers (1998), pp. 793, £221.00. ISBN 0-7923-5230.

This book is a synthesis of papers presented at the Fifth Symposium of the International Society of Root Research, held in South Carolina in July 1996. It is a large volume, with 68 papers in six sections: global patterns of carbon allocation; managed and unmanaged ecosystems; sustainable agroecosystems; ground water quality; genetics, physiology and molecular biology; methods for measuring root dynamics.

The volume will provide an excellent resource for root biologists in terms of its breadth of contents and the generally detailed bibliographies. The section on methods for measuring root dynamics is particularly useful in covering an important but ignored area.

With one or two exceptions, papers are of a reasonable standard in terms of source material, novelty and presentation. One irritation is that a number of the papers included in this volume have been published previously, in an identical form, in *Plant and Soil*. While this is indicated, one is left to consider why the authors found it impossible to contribute something original for this publication?

It was encouraging to see how many papers came from Russia and Central Europe – a huge resource of knowledge that is still relatively untapped in the Western World. Of course, the references in these papers include a large number of citations that will prove extremely difficult, if not impossible, to obtain.

K. R. Skene

Rainfed Lowland Rice: Advances in Nutrient Management Research. Edited by J. K. Ladha, L. Wade, A. Dobermann, W. Reichardt, G. J. D. Kirk and C. Piggan. Manila, The Philippines: International Rice Research Institute (1998), pp. 304, HDC US\$30.80, LDC US\$8.00. ISBN 971-22-0117-1.

This book is the proceedings of an International Workshop on rainfed lowland rice held in Ubon, Thailand, in October 1998. It contains 18 papers grouped under seven headings: introduction and background; characterization of environments; nutrient balances; managing organic matter; nutrient \times water interactions; soil physical constraints and nutrient availability; and germplasm for improved nutrient efficiency.

Forty-five per cent of the world's rice is rainfed, but average yields are currently 1.9 t ha^{-1} as against 4.9 t ha^{-1} for the irrigated crop. It is suggested that improvements in the rainfed crop will have to supply much of the 36% increase in output expected to be required by 2020. However, the extreme hydrological conditions suffered by the crop, ranging from drought to waterlogging and the corresponding oxidation and reduction of the soil, present unique difficulties in relation to mineral nutrition.

The subjects covered include simple methods of soil classification in Cambodia, empirical fertility studies on nitrogen, phosphorus, potassium and sulphur in Lao PDR, attempts to calculate nutrient balances for quantification of nitrogen losses (which reach 550 kg ha^{-1}) in rice-vegetable systems, green manures and catch crops, the trend towards direct seeding, and rhizosphere effects which may be important in nutrient uptake.

This is a well-presented record of the formidable problems confronting the researchers involved. The inclusion of most of the authors' e-mail addresses will hopefully encourage a worldwide dialogue on the subject.

A. Scaife

Advances in Hybrid Rice Technology. Edited by S. S. Virmani, E. A. Siddiq and K. Muralidharan. Manila, The Philippines: International Rice Research Institute (1998), pp. 443, hardback US\$32.75, paperback US\$8.75. ISBN 971-22-0115-5.

This weighty volume represents the Third International Symposium on Hybrid Rice held in Hyderabad in 1996. It was co-sponsored by IRRI, ICAR, UNDP and FAO. It contains 37 chapters of widely varying length and quality, mostly by several authors. All chapters are preceded by adequate abstracts. The book (mine was the paperback) is well made, well edited and well produced. There are some trivia, but also much information on the 'state of the art' of hybrid (HYB) rice.

China has been growing HYB rice in the temperate zone of the Yangtse since the 1970s, using a 'wild' CMS (and therefore a narrow cytoplasmic base). IRRI and several tropical countries followed, mostly in the 1980s, using locally adapted materials and the technology is now just beginning to work elsewhere, especially in India. Technical problems of effective MS systems (not necessarily CMS and restorers), seed production, economics, grain quality and others abound; there is much effort, largely founded on biotechnological techniques, to develop apomixis (and thus partially to negate HYB cultivars).

Few will want to read this book in detail but rice workers will need to see it, and its contents certainly have general bearing on the use of HYB varieties in what is essentially a 'difficult' crop. Like all such symposial works, it is too long and too fuzzy but contains much information and the price is remarkably low for a very decent production. It does not attack the fundamental question: if HYB rice works well, what then can research do about subsequent population pressure?

N. W. Simmonds

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*.

Wheat Production in Bangladesh. Technological, Economic and Policy Issues. By M. L. Morris, N. Chowdhury and C. Meisner: Washington DC: International Food Policy Research Institute (1997), pp. 95. No price quoted. ISBN 0-89629-109-X.

Pollution Prevention and Abatement Handbook 1998. Toward Cleaner Production. Washington DC: The World Bank† (1999), pp. 457, US\$125.00. ISBN 0-8213-3638-X.

The World Bank, the Grant Program and the CGIAR, A Retrospective Review. OED Working Paper Series No. 1, March 1999. By J. R. Anderson and D. G. Dalrymple. Washington DC: The World Bank (1999), pp. 98.

Strategic Reforms for Agricultural Growth in Pakistan. WBI Learning Resources Series. Edited by R. Faruqee. Washington DC: The World Bank (1999), pp. 153, US\$30.00. ISBN 0-8213-4336-X.

Legal Impediments to Effective Land Relations in Eastern Europe and Central Asia. A Comparative Perspective. World Bank Technical Paper No. 436. Europe & Central Asia Environmentally and Socially Sustainable Development Series. Edited by R. Prosterman and T. Hanstad. Washington DC: The World Bank (1999), pp. 325, US\$30.00. ISBN 0-8213-4501-X.

Food and Agriculture in the Czech Republic. From a 'Velvet' Transition to the Challenges of EU Accession. World Bank Technical Paper No. 437. Europe & Central Asia Environmentally and Socially Sustainable Rural Development Series. Edited by C. Csaki, M. Debatisse and O. Honisch. Washington DC: The World Bank (1999), pp. 91, US\$22.00. ISBN 0-8213-4502-8.

Irrigated Rice in the Sahel: Prospects for Sustainable Development. Edited by K. M. Miézan, M. C. S. Wopereis, M. Dingkuhn, J. Deckers and T. F. Randolph. Bouaké, Côte d'Ivoire: West Africa Rice Development Association (1997), pp. 487, no price quoted. ISBN 92-9113-1091.

† 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.