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BOOK REVIEWS

The Neem Tree Azadirachta indica *A. Juss. and Other Meliaceous Plants: Source of Unique Products for Integrated Pest Management, Medicine, Industry and Other Purposes*. Edited by H. Schmutterer. Weinheim, Federal Republic of Germany: VCH (1995), pp. 716, DM198.00. ISBN 3-527-30054-6.

Beneficial uses of the neem tree have been known for centuries in countries such as India. Only more recently, however, have westerners begun to appreciate and explore its usefulness. This book brings together many years of research and anecdotal observations, leaving the reader with the impression that neem has an extremely broad range of applications, many of which are in only the early stages of discovery.

The largest chapter considers the most familiar uses of neem, namely the pesticidal properties of azadirachtin (the principal active compound of the tree, particularly its seeds). The account reviews activity not only against insects but, for example, antiviral and antibacterial properties and the development of neem-derived compounds to control fungal plant pathogens and plant parasitic nematodes. Regarding insecticidal activity, the physiological targets of azadirachtin and its effects at the hormonal and molecular levels are discussed.

Accounts of the insecticidal effects of neem are accompanied by a review of neem application against arthropod pests (for example, of vegetables, grains and stored products). Results varied but suggest that further trials might reveal great economic potential in rural areas of tropical developing countries, especially in integrated pest management systems, because effects on non-target organisms are slight. Although numerous neem-based products are now available there are many problems in supplying azadirachtin-rich neem extracts. Current investigations towards the total synthesis of azadirachtin are described and accompanied by a synopsis of efforts to define its full structure and the needs for further study.

The detailed account of the active compound is complemented by information on the ecology of the tree and various sociocultural facts. *Azadirachta indica* has long held a major role in Indian culture, from its use in warding-off evil spirits to that of a household remedy for common ailments. The extending use of neem is an example of 'science learning from culture' which is comprehensively illustrated including neem's uses in modern medicine, soap production, rope making and as shade trees.

Alison Blackwell

Integrated Pest Management in the Tropics: Current Status and Future Prospects. Edited by A. N. Mangech, K. N. Saxena and H. N. B. Gopalan. Chichester and New York: John Wiley (1995), pp. 171, £35.00. ISBN 0-1471-96076-4.

The principles of integrated pest management (IPM) are simply stated but, as this book clearly demonstrates, each cropping system and region requires a unique solution to the problems of achieving IPM. This book is based on a review, commissioned jointly by the United Nations Environment Programme and the Centre of Insect Physiology and Ecology, of the results of IPM in the tropical regions of Africa, Asia and South America. The three main chapters describe current

trends and future prospects for IPM in each region. The book concludes with ten valuable pages of executive summary and recommendations, in which the editors identify the main trends in each region and suggest developments. The conclusions of this section are important for IPM throughout the world.

The book emphasizes that there are two main constraints in developing IPM programmes: first, the difficulty of developing programmes in which the components are compatible; and second, the difficulty of convincing growers of the benefits of the system. It is stressed that future initiatives in IPM will need to come from researchers and policy makers. Although novel approaches, such as transgenic plants, are likely to contribute to the development of IPM, success will continue to depend on conventional methods, including pesticides, for at least the next decade. However, the clear message of this book is that IPM should progress from emphasis on pesticides to biologically based management in which conservation and enhancement of natural enemies have a key role. These important changes are further discussed in the next book reviewed below.

David Glen

Insect Natural Enemies: Practical Approaches to their Study and Evaluation. Edited by M. Jervis and N. Kidd. London: Chapman and Hall (1995), pp. 491, £69.00. ISBN 0-142-39900-8.

That there is much literature on insect natural enemies is to be expected, given their crucial roles in integrated pest management, their fascinating biology and the diverse interactions with prey or hosts. Until now, however, there has been no book of this type, which provides advanced students and researchers with guidance on how to set about studying insect parasitoids and predators. The editors point out that the coverage of the book is not exhaustive, partly because certain areas are well covered by other texts. Chapter 1 on foraging behaviour, emphasizes that because the design of behavioural experiments affects their outcome, researchers must design experiments appropriate to the questions to be answered. Chapter 2 on life cycles, covers important aspects of the life cycles of both parasitoids and predators. Chapter 3 on mating behaviour, concentrates on studies of parasitoids, but makes points which are relevant to the study of all natural enemies, with particular reference to the problems of mass rearing. Chapter 4 on populations and communities, contains a comprehensive account of field sampling techniques, including the advantages and disadvantages of various methods, followed by a section describing techniques for determining trophic relationships. Chapter 5 on population dynamics, describes how to assess the role of natural enemies in insect population dynamics and how this information can be used in selecting biological control agents. The final chapter, on phytophagy, is an important one as plant feeding by natural enemies has been a relatively neglected subject. The book ends with a valuable reference list.

David Glen

Sustainable Dryland Farming: Combining Farmer Innovation and Medic Pasture in a Mediterranean Climate. By Lynne Chatterton and Brian Chatterton. Cambridge: Cambridge University Press (1996), pp. 339, hardback £60.00. ISBN 0-521-33141-2.

This book begins with an account of how annual legume pastures of *Medicago* spp. are established and regenerated in the integrated cereal-livestock farming systems of South Australia. It continues with a review of the many attempts over the last forty years to reintroduce medic pastures to the Mediterranean regions of West Asia and North Africa, where medics originated, as a means of increasing their productivity, reducing the dependence on imported feed for livestock, and arresting the current degradation of land resources.

Some of these attempts succeeded in demonstrating the benefits of medic pastures. The authors examine why in spite of these results there are few examples of any lasting impact from them.

Readers who, like the authors, believe in the potential for developing medic pastures will share their concern about past failures, and the fact that these are also a potent source of the continuing scepticism about the prospect for introducing medics into the farming systems of West Asia and North Africa.

It would be unfortunate if readers were to get the impression that it is a simple matter to introduce a farming system that has proved successful in one part of the world into another where the traditional patterns of ownership and management of land, crops, and livestock are completely different. Nor is the key to success, and the explanation of past failure, likely to rest solely on a few simple technical aspects, vital as those may be. The undertaking requires a combination of many different talents and no single group of experienced practitioners or technical experts has a monopoly, though the authors often suggest otherwise in the text. Most readers would probably have preferred to be spared the insistent and gratuitous condemnation of individuals and institutions of the scientific community. These reflect personal views and detract from the objectivity of an otherwise valuable review of what is still an important development prospect for West Asia and North Africa.

P. R. Goldsworthy

Crop Evolution, Adaptation and Yield. By L. T. Evans, Cambridge: Cambridge University Press (1996), pp. 500, paperback £22.95, US$32.96. ISBN 0-521-29558-0.

The hardback edition of this important and scholarly book was favourably reviewed by M. H. Arnold in *Experimental Agriculture* (1994) 30:370. This paperback edition seems worthy of a welcome and another mention.

J. M. Hirst

Lost Crops of Africa: Volume 1. Grains. By the Board on Science and Technology for International Development, National Research Council. Washington DC: National Academy Press (1996), pp. 383, £20.95. ISBN 0-309-04990-3.

This book, published without attributed authors under the auspices of the National Research Council of the USA, sets out to draw attention to the potential value of indigenous cereal species for African subsistence agriculture. This is done by surveying the species concerned, African rice, finger millet, fonio (*Digitaria* spp.), pearl millet, sorghum, tef (*Eragrostis tef*), emmer wheat and Ethiopian barley and oats, drawing attention to the limited work being done on them.

However, its usefulness is marred by inconsistencies and errors. For example, the statement on page 101 that there is little to be gained by breeding improved varieties when the mixed varieties now grown are well adapted to meet the varied hazards that they might encounter is followed by a section extolling the virtues of plant breeding and the highly successful introduction of ICRISAT cultivars in Namibia. It is stated on page 240 that einkorn wheat was 'virtually extinct' until recently found in the Southern Alps! Furthermore, although the book purports to address the problems of African subsistence agriculture, near one-quarter of the text is devoted to the commercial development of pearl millet and sorghum in the USA, and the section on the development of sorghum as a fuel crop can have little relevance.

The book is poorly presented with the text repeatedly interrupted by extensive 'boxes' expanding in unnecessary detail on points raised. It does little to promote the study of an important subject.

F. G. H. Lupton

A Century of Mycology. Edited by B. C. Sutton. Cambridge: Cambridge University Press (1996), pp. 308, hardback £60.00, US$90.00. ISBN 0-521-57056-5.

The Centenary of the British Mycological Society fell in 1996 so it was a year of celebration, of taking stock and looking forward. Although fungus-hunting naturalists did most to found the Society, a professional component soon developed and both have developed in fruitful symbiosis ever since. This book comprises a selection of contributions to the Centenary Symposium, held in Sheffield, which emphasized the achievements of mycological research.

In an opening keynote address the President, J. Webster surveyed the overall situation very competently, thus allowing more selection of later contributions, often accompanied by personal recollections. For example, how 90-year-old Professor C. T. Ingold came to establish such knowledge of both dispersal and the aquatic hyphomycetes. The Society's early history was much fostered both by interests in taxonomy (Roy Watling) and tropical mycology (D. N. Pegler), the latter dealing with both the fungus flora and the pathogens damaging crops throughout the empire.

Most of the later contributions were up-to-date and personal reviews by specialists dealing respectively with: hyphae (Salomon Bartnicki-Garcia); conidiogenesis (B. C. Sutton); the flagellated spore (M. S. Fuller); the mycelium (A. D. M. Rayner); mutualism in the mycorrhizal symbiosis (D. J. Read); lichens and the environment (M. R. D. Seaward); and recording and mapping fungi (D. W. Minter).

Considering that the UK no longer has such large overseas responsibilities and that the Society shares, with other bodies, many legitimate interests (such as plant pathogens, allergens, antibiotics and pharmceuticals, yeasts and lichens), it might seem that its future prospects would diminish. However, the content of this book and the current international success of the Society's journal, *Mycological Research*, dispel such fears and predict an active second century.

J. M. Hirst

Ainsworth and Bisby's: Dictionary of the Fungi. Eighth Edition. By D. L. Hawksworth, P. M. Kirk, B. C. Sutton and D. N. Pegler. Wallingford, UK: CAB INTERNATIONAL (1995), pp. 616, £30.00 (Americas only US$49.95). ISBN 0-85198-885-7.

To anyone concerned with fungi the title of this book is already a household term, the fact that this edition came 52 years after the first shows durability and the satisfaction of a need. The dedication to 90-year-old Geoffrey Ainsworth is both well merited and informative of the history of the 'Dictionary'. During those 50 years the birthplace Mycological Institute was at first prefaced by Imperial, then Commonwealth and finally International. These changes reflect a new main base at Egham and the growing international contributions and influence of the publishers. The four main authors (one from the Royal Botanic Gardens, Kew) now acknowledge 55 contributors and thank many others. More and larger pages mean that the content must have increased by at least one-third since the Seventh Edition.

Compilation has been greatly assisted by electronic information handling. Many of the changes of detail reflect new techniques in biology and new possibilities of genetic analysis, these have of course made some changes advisable in systematic arrangements. I suspect that most use will still be made of the nearly 500 pages of alphabetical entries, but these are now followed by about 50 pages devoted to keys to the families of fungal phyla and then about 75 pages devoted to systematic arrangement.

I have already found the dictionary indispensable in updating my understanding of new terminology. For such a wealth of information, which is well presented and interspersed with relevant diagrams, the price is very reasonable and will ensure success.

J. M. Hirst

Apple Scab: Biology, Epidemiology and Management. By William E. MacHardy. St. Paul, Minnesota: The Amercian Phytopathological Society (1996), pp. 570, US$99.00. ISBN 1-600-328-7560.

Even though apple scab, caused by the fungus *Venturia inaequalis*, is a classic crop disease studied worldwide for over a century, a book devoted to this alone needs to have special features to merit a review in *Experimental Agriculture*. This book qualifies easily. Few books of 570 information-packed pages now come from a single author; wisely he acknowledges many helpers, naming some thirty experts, and unusually he is able to thank seven companies or trade organization for financial support. The results are impressive; planning and structure benefit greatly from one firm pen. The first six pages define language and methods to avoid confusion bred during a century of change. The next three pages establish the three main 'parts', biology (10 chapters), epidemiology (13 chapters) and management (11 chapters). Throughout, the text is structured most helpfully by frequent subject headings that reveal a pattern of presenting factual evidence, frequently summarized and followed by sectional conclusions, often (and admittedly) slanted by the author's judgement.

The account of the origin, history and spread of apple scab is the best I know. Although necessary and helpful, I found some of the 39 colour photographs of lesser quality than the text which describes the pathogen and disease in great detail and completeness. I am confident that most researchers will often discover much that is new to them. My most critical reading concerned the chapters on epidemiology, where I found no complaint and often read constructive criticism. Colleages better versed in chemical control and disease management reported similarly. In the final chapters, which deal with disease modelling and recent attempts to manage scab with less reliance on fungicides alone, the book lays foundations for work into the twenty-first century.

This book will, I am sure, be a lasting monument to decades of worldwide cooperation in plant pathology and crop protection; it has fulfilled its objectives. It may therefore be churlish to indicate where I would have liked more comment. The philosophy and economics of scab control are fascinating and complex. During recent decades the demands for spotless apples has been dominant, but where in the future should we strive to establish a balance between the costs of spraying, acceptable damage to the host by the pathogen and the insistent demand for perfection by the consumer?

I congratulate William MacHardy and his supporters, thank the sponsors (from whom I could detect no influence or bias) for enabling the work, and I praise The American Phytopathological Society for fostering and publishing such a notable scientific work.

J. M. Hirst

Climate Variability, Climate Change and Social Vulnerability in the Semi-arid Tropics. Edited by J. C. Ribot, A. R. Magalhâes and S. S. Panagides. Cambridge: Cambridge University Press (1996), pp. 175, £50.00, US$74.95. ISBN 0-521-48074-4.

Those who live in the richer nations of the world are mostly buffered from the impact of climate variability by the abundant provision of clothing, housing and food. We are therefore not (yet!) unduly concerned about the prospect of climate change. Elsewhere, and especially in the semi-arid tropics where climate is much harsher, more fickle and more extreme, life has always been far tougher. As climates change, survival in these regions may become even more difficult with the manifold implications discussed in this volume.

The book contains papers presented at an International Conference on Impacts of Climate Variations and Sustainable Development in Semi-Arid Regions held in 1992. As the title suggests, the main emphasis is on social and economic sensitivity to climate change based on a study of ways in which communities and nations have coped in the past with climatic extremes and anomalies. No complex models of climates or crops are described, no spuriously precise forecasts are presented. Illustrations are mainly in the form of maps and bar charts, supplemented by tables. Most of the

book deals with case studies for specific regions from which general lessons are drawn about how the adaptability of man has often, but not always, succeeded in overcoming the unpredictability of nature. The book concludes with a Declaration, presented at the subsequent UN Conference in Rio, which sets out the need for special international action to help nations in the semi-arid tropics. However, an additional preface comments that, in Rio, 'concerns about the living relation between local peoples and their natural resource base were overshadowed by global concerns'.

J. L. Monteith

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*.

Energy Use, Air Pollution and Environmental Policy in Krakow: Can Economic Incentives Really Help? (World Bank Technical Paper No. 308.) By S. Adamson, R. Bates, R. Laslett and A. Pototochnig. Washington DC: The World Bank† (1996), pp. 67, US$7.95. ISBN 0-8213-3494-8.

Evaluation de l'Impact de Pueplement et de Dévelopment dans le Basin du Cours Supérieur de la Léraba: Burkina Faso, Côte d'Ivoire et Mali. By D. Baldry, D. Calamore et Laurent Yaméoyo. Washington DC: The World Bank† (1996), pp. 38, US$7.95. ISBN 0-8213-3532-4.

Sustainability and the Wealth of Nations: First Steps in an Ongoing Journey. (Environmentally Sustainable Development Studies and Monographs Series No. 5.) By Ismail Serageldin. Washington DC: The World Bank† (1996), pp. 23, US$7.95. ISBN 0-8213-3551-0.

Institutional Change and Effective Financing of Agricultural Research in Latin America. (World Bank Technical Paper No. 330.) By Ruben G. Echeverria, Eduardo J. Trigo and Derek Byerlee. Washington DC: The World Bank† (1996), pp. 34, US$7.95. ISBN 0-6213-3709-2.

†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.