

## Book Reviews

### Unsere Alpenflora

E. Landolt.

Gustav Fischer Verlag, Stuttgart, Jena. 1992.  
318 pp. + 120 plates. Hardcover, DM 48.00.  
ISBN 3-437-20488-2.

This is a book not primarily meant for scientific use, but it may be seen as a useful tool for tourists with botanical interest and with some basic knowledge. Relative to its size, in the first five chapters quite a number of pages deal with basic information. The origin of the alpine flora since the Tertiary and its subsequent development through time, as well as the main phytogeographic relations of the region to the Floristic Regions are treated. Subsequent to this, attention has been paid to the peculiar aspects of alpine climate and soil development, and their consequences and constraints for plant growth and the emanant patterns of adaptations. These chapters especially may be informative for people from low countries, who are unfamiliar with these alpine phenomena. The wide systematic and ecological experience of the author, and the large number of illustrations and literature references in this section are very helpful. However, the references to the literature cited and suggested for further reading are coded in a complicated way, possibly to save some space, and this will not stimulate the reader to search for it. The following extensive chapter deals with the vegetational zones ('Höhenstufen') and plant communities, mainly based on Braun-Blanquet typology, and restricted to the synsystematic level of allies.

Being well written and presenting a fine overview of plant growth in the Alps, these introductory chapters are of great value and give this book considerable added value compared to many others that present just picture collections.

A set of seven keys helps identification mostly to the level of the genus. The reader will have to compare the species descriptions within the genus to reach a final decision on the species level. The extensive ecological information on each species will certainly help. There are also some 480 full colour photographs to help with identifications. Most of these pictures are quite well taken, but they are hardly decisive to the species level within those genera of which a series of species occur in the area, as for example in the families Ranunculaceae, Cruciferae, and Papilionaceae. Two additional remarks may be made here. Apparently, the nomenclature is not (at least not completely) according to the *Flora Europaea*. With respect to the keys, I would like to suggest adding page references to the extensive fam-

ily and genus descriptions, and possibly also to the plates.

In conclusion, this booklet, an initiative of the 'Schweizer Alpen-Club', undoubtedly is a fine guide for any person with interest in plants and vegetation of the higher elevations of the Alpine region (only elevations of over 1500 m are dealt with). Extra advantages are its small size, hard cover and, last but not least, the fact that an English edition is available now.

J.C.M. DEN NIJS

### Crop Evolution, Adaptation and Yield

L.T. Evans.

Cambridge University Press, Cambridge. 1993.  
xi + 500 pp. Hardback £60.00 US\$95.00 ISBN  
0-521-22571-X.

In the history of plant breeding, only the last few hundred years have known a recorded deliberate genetic improvement of plants by man for his own purposes. Nevertheless, these efforts are built upon 10 000 years of crop evolution, i.e. the domestication and adaptation of a variety of useful plant species. This history of man-guided evolution until the present is the subject of the exceptionally well documented treatise by plant physiologist Lloyd Evans from New Zealand. Evans shows his thorough knowledge of the physiological basis and constraints of small grain yield in a discussion of breeding histories of crops as common as maize and wheat and as unknown as quinoa and wild rice. Crops for food, feed and fibre are considered but also for fuel, pharmacy and industrial uses. The only category missing seems to be the ornamentals, but this group has an overall short breeding history.

The leading theme throughout the book is crop yield and yield potential. In eight extended chapters the author discusses the increasing need for a better food supply, and for crop domestication, adaptation and the ecology of yield. This includes adaptations to cultivation and to new, different growing environments which set new limits to crop production. For example, many of the successful crops in temperate regions are tropical annuals, and light and temperature in such climates limit photosynthesis and dry matter yields.

The crucial role of improving the harvest index in those crops harvested for, e.g. grain, tuber or fruit is emphasized, and the need and potential for making the best use of inputs like water, fossil energy and pesticides while maximizing harvestable yield are considered at length.

The most challenging chapter deals with the future of yield, where the author explains the contrasting interests in food production and a sound environment, and argues for inputs of knowledge to begin with at the farm level. Evans foresees an agricultural future dominated by computer power and the power of scientific research, but integrated into a synergistic knowledge of the complex agro-ecosystem.

This well-written book could not have been published at a better time now that FAO, under the new leadership of Jaques Diouf, has announced a second green revolution to combat the ever more serious threat of world-wide hunger. There is a desperate need to overcome the physical, physiological and genetic constraints to yield improvement, with water use efficiency and salinity stress tolerance as two critical success factors. The book examines these problems in depth, and one of its virtues will be the assistance it may render to help break the crop yield improvement barrier.

Although the plant physiologist viewpoint is most clearly visible, other important disciplines from genetics to irrigation are also well covered, so a broad treatise has resulted.

This book presents a good value-for-money deal despite its fairly high price, and should be open on the desk of many agriculturalists and other specialists dealing with the future of agricultural technology and its prime function, providing food for the hungry.

A. P. M. DEN NIJS

### Breeding for Disease Resistance

R. Johnson and G. J. Jellis (eds).

Kluwer Academic Publishers Group, Dordrecht, 1993. 205 pp. Hardback Dfl.140.00 US\$87.00 UK £57.50. ISBN 0-7923-1607-X.

This book contains the proceedings of an international conference, held late 1991 at Newcastle-upon-Tyne, UK. It is a hard-bound reprint of *Euphytica*, vol. 63 (1-2) and should be present in all libraries that subscribe to that journal. The book contains a very brief preface, 16 review papers by various (mostly British) authors and an index. Of course, the title of the book cannot be covered completely and systematically by 16 rather specialist papers. However, the papers offer illustrations of 'how breeding for resistance faces a great diversity of challenges requiring a range of different solutions', as the editors state in the preface.

Durability of resistance is the challenge addressed in so many of the contributions, that it has not been entered into the index. In several contributions, emphasis is on the empirical and unpredictable nature of durability. In some cases, for instance lettuce-lettuce mosaic virus, some factors that may have

contributed to (lack of) durability are proposed. Given the prominence of durability of resistance, I was surprised to find so little attention given to the strategy to pyramid major genes for resistance. With the aid of molecular markers this strategy has become feasible, as explained briefly in Steffenson's contribution on barley-stem rust.

In general, the contributions address topics with immediate relevance to breeders. Examples are the need of economic justification of breeding for resistance to certain diseases. Most protected horticultural crops, for example, are commercially not sufficiently significant to warrant the large expenditure of a breeding programme for disease resistance (Fletcher, on horticultural crops in the UK). Another practical aspect is the availability of sources of resistance. Several examples are cited where simply no (clear) resistance in the crop has been identified (e.g. in maize and millet to *Striga*; Lane & Bailey). In such cases wild related species may be the only resource (wheat-eyespot; Johnson). I liked the broad diversity of crop-pathosystems addressed by the contributors. Not only the well-known large crops such as potato, rice, barley, wheat and lettuce receive attention, there are also contributions on the state of the art in red raspberry, cowpea-*Striga* and ornamental crops.

Two contributions deal with resistance to viruses. Since crop protection by antiviral chemicals is not feasible, host resistance is the main means of control. One paper deals with naturally occurring resistance, the other with 'artificial' resistance achieved by molecular breeding techniques.

The index not only contains the names of crops, pathogens, countries and terms, but also the gene symbols for pathogenicity and resistance. This makes the book a useful, albeit not complete, source of reference.

R.E. NIJS

### The Haustorium

N.N. Bhandari & K.G. Mukerji.

R.S. Press Ltd, Taunton, Somerset, England/Wiley, New York. 1993. xii+308 pp. Hardback, UK £62.50. ISBN 0-86380-129-3.

*The Haustorium* compiles and analyses the literature on haustoria of parasitic and non-parasitic angiosperms and fungal parasites. The authors consider these data important for agricultural and horticultural applications and the involvement of a molecular approach on haustorial regulatory mechanisms between parasites and hosts.

The book is divided into two parts: the angiosperm haustorium and the fungal haustorium. The composition is logic and clear, and an explanation of the terminology used opens each part. The terms are well defined and, especially in the fungal part, the

similarity and distinction between several terms is discussed.

The gametophytic haustorium of angiosperms is given first attention. The data presented, mainly morphological, show the diversity of ways of nutrition of embryo or endosperm by haustoria. Less attention is paid to pollentube remnants involved in embryo nutrition. The description of the sporophytic haustoria begins with the seed germination, and presents the physiological conditions as well as the effects of synthetic chemicals on germination. The various ways of exogenous induction of haustoria mentioned illustrates the relatively scarce knowledge about parasitic plant-plant interaction. The initiation of haustorium is illustrated on different plant families with a lot of structural data and followed by an extensive chapter with developmental and structural aspects of gametophytic and sporophytic haustoria within several families. The final part presents the internal organization followed by the analysis of the nutritive function of the haustorium. Data about mineral nutrition, transpiration, water and pressure gradient and the translocation of nutrients give an insight in this complex interaction process.

The diversity of fungal haustoria types are clearly classified on anatomical and morphological characteristics. The process of host cell penetration is followed by a description of the haustorium mother cell, the haustorial neck and body. Following this more structural information, the nature of the adhesive substance, the reaction of the host encapsulation, the extra-haustorial membrane and encasement are discussed. The haustorial nutrient transfer system as a function of the parasite-host interaction is illustrated in different species. Finally, the incompatibility and interference by fungicides on haustorial growth are given. Mycorrhizas have branched hyphae partly for the function of nutrition and therefore comparable with haustoria. A short chapter presents the types and their development.

In a final conclusive overview the authors point to the special interface between haustorium and host and present a model explaining the transfer from host to haustorium via the interface which is closed by the neck band.

The book presents a lot of data, which are clearly ordered and easy to find because of the extensive author, plant and subject index. The literature cited represents over 500 papers up to 1990. The figures are representative but do not always have a complete explanation and their distant placement in the text is not very convenient for the reader.

This book is recommended not only to specialists in the field as a source of information and an overview, but also to students as potential researchers in this complex field of host-parasite interaction.

M.T.M. WILLEMSE

## Moss Protonema Differentiation

Satish C. Bhatla.

John Wiley & Sons, Chichester. 1993. xviii + 296 pp. Hardback, UK £51.00. ISBN 0-86380-157-9 (Wiley Inc. 0 471 94438 6).

*Moss Protonema Differentiation* provides a comprehensive description of the biology of the development of moss protonema. In four chapters the structure of spores and protonema, germination and gravitropism are described. The next four chapters deal with the role of auxins, cAMP, cytokinin and calcium on various developmental events. Chapter 9 is dedicated to the biochemical and molecular biological aspects. Emphasis is clearly on the hormonal control of growth and differentiation, thus reflecting the interests of the author. A flaw in the book is the restriction to the moss protonema. It is an omission that the early development of the moss shoots and/or sporangium/spore formation are not included. Alternatively, the scope of the book could have been extended to fern spores and protonema, which bear so many similarities to those of the mosses. The pretention to provide an up-to-date, in-depth analysis of cell differentiation in moss protonemata does not measure up. The conceptual basis of the book is out-dated and there is a lack in systematic treatment of some topics. The treatment of the cell biology of the spores and protonemata is poor and untidy. The descriptions of the cell wall in particular, the cytoskeleton and their relationship to cell division and growth are very fragmentary and do no justice to the importance awarded to these structures nowadays. The most striking phenomenon of protonema cells is their tip growth, which they share with most fungi, root hairs, pollen tubes and indeed fern protonema cells. Relevant literature like *Tip Growth in Plant and Fungal Cells* (I.B. Heath, Academic Press Inc. 1990), still the most comprehensive work on this topic, is not mentioned. The descriptions of wall, cytoskeleton, organel distribution, plasmastreaming and various types of gradients would have benefitted greatly and a comparison with various tip growth models should have been made. Prominently absent is a comparison with the fern *Adiantum* with its intriguing cell divisions. The differences between the Marchantiales and Musci are hardly mentioned. From the descriptions it is not clear whether systematic differences in protonema development exist between these groups. Also, a discussion on the relationship with the protonema of Characean cells is absent. The index is incomplete, an index of species is lacking. Sometimes the text is sloppy, with too many typing errors and unimpressive artwork.

However, the author is right in his statement that this is the first single comprehensive work on this

topic and credit should be given to the extensive description of hormone actions and the beginning of a discussion on regulatory events on the cellular level in chapter 9. Despite the flaws, this book contains valuable information for all those interested in moss protonema. Students and scientists starting their research on mosses may greatly benefit.

J.W.M. DERKSEN

### Progress in Botany/Fortschritte der Botanik, Vol. 55

H.-D. Behnke, U. Lüttge, K. Esser, J.W. Kadereit and M. Runge (eds).  
Springer Verlag, Heidelberg. 1994. xviii + 393 pp.  
Hardback, DM298.00; ös 2.324,40; sFr293.  
ISBN 3-540-57321-6.

In *Acta Bot. Neerl.* 43(1), I reviewed Vol. 54 of *Progress of Botany* and gave a short description of the history and aims of the series. Now here is Vol. 55, about 150 pages shorter than the massive last one, but covering possibly an even wider variety of topics in 21 highly informative literature reviews. The volume is dedicated to Professor Hubert Ziegler who, among his many other achievements, has edited the *Physiology* section of *Progress* for 25 years. There are the usual five sections: Structural Botany (2 chapters), Physiology (9), Genetics (6), Taxonomy (3) and Geobotany (1). The Geobotany chapter by Seidling, Starfinger and Stöcklin deals with Plant Population Ecology. A corresponding chapter by Tomiuk and Wöhrmann in the Genetics Section treats Population Genetics, with special emphasis on its consequences for the conservation of genes. Population Biology has no secure tradition in Middle Europe. Very recently, for instance, it has lost one of its centres in Germany while there is a very active resurgence in Switzerland. The timely appearance of the two chapters here suggests that regular annual updates on aspects of Population Biology in *Progress in Botany* may be a very effective way to document the development of the field for all botanists, and to help integrate Central European efforts with those elsewhere. The chapter by Sytsma and Hahn on 'Molecular Systematics 1991-1993' in the Taxonomy section also illustrates international progress in a research area that only recently is becoming established in Europe. With chapters like these, *Progress in Botany* plays a crucial role in reducing historical differences in research style and research emphasis within Europe and between Europe and the rest of the world. Without any change in intent and format, simply by the choice of topics and authors, *Progress of Botany* is here more than a thorough and intelligent annual digest of the botanical literature. Of course there are many research areas where paradigms and methods are identical all across the world,

and these are covered regularly and thoroughly in *Progress in Botany*. Occasional short chapters deal with more limited topics in which there have been important recent developments. Kluge *et al.* recommend *Geosiphon pyriforme* as a promising system for studying endocyanoses, Rennenberg and Brunold relate glutathion metabolism and stress, Nagl reports on replication and cell cycle control, Blaich describes the regulation of seed storage protein genes. There is something for everybody. It is mainly, but not exclusively, in areas of organismic biology that Central European science sometimes has a local accent. Cultural differences are charming and exciting outside science. In science, however, they suggest a lack of communication. Communication these days does not necessarily mean 'finding out what they do in America'. Molecular Systematics hopefully is one of the last major research developments that had to be imported. Information exchange in all directions is becoming ever more important. The unique integration of thorough literature surveys with reviews that provide the background perspective is the enduring strength of *Progress in Botany*. More than in previous volumes, the present one shows the additional value of *Progress* as a forum for a balanced information exchange between European botanists and their colleagues outside Europe. The series should be within reach of every botanist.

K. BACHMANN

### Expanding the Production and Use of Cool Season Food Legumes

F.J. Muehlbauer and W.J. Kaiser (eds).  
Kluwer Academic Publishers Group, Dordrecht.  
1994. xxxii + 991 pp. Hardback, Dfl.800.00;  
US\$456.00; UK £312.00; ISBN 0-7923-2535-4.

The cool season food legumes have marginally gained in production, but not in availability, as per capita supply decreased despite increased demand. As traditionally important components of the diet in many developing regions, research inputs have offset the decrease caused by the continued shift towards more marginal land. Trends and supply and demand are outlined in the keynote address (Oram & Agcaoil). The reasons are clearly outlined in this huge volume, where a state-of-the-art situation is given in the form of proceedings of the Second International Food Legume Research Conference on pea, lentil, faba bean, chickpea, and grasspea, held in Cairo, Egypt, 12-16 April 1992. After the first conference in Spokane (1986) and the proceedings edited by Summerfield, persistent constraints and opportunities are treated in contributions by 196 authors from 37 countries to 57 invited papers. The papers tend to have repetitive statements about the situation

in food legumes, an advantage of which is readability of the independent chapters.

The papers are arranged in themes such as processing and animal feeds, climate change and stresses, host plant resistance, policy incentives, breeding methods, infrastructural support, legume breeding, stress management, biotechnology and gene mapping, crop physiology and productivity, farmers' constraints and on-farm research. Regional reports discuss the situation wherever the legumes, mainly of mediterranean origin, are cultivated and research is carried out. The grasspea of W Asia and S Europe, *Lathyrus sativus*, has been added because prospects for this undemanding legume, valuable but poison-containing, have become more real. Low  $\beta$ -N-oxalyl-L- $\alpha$ -diaminopropionic acid (ODAP) containing cultivars must be developed to offset chances of lathyrism, the paralytic syndrome of neurolathyrism. Low ODAP lines reported from India during the seventies did not deliver the goods, apparently, but sufficient variation in ODAP content is available in germplasm (Smartt *et al.*).

Fallow replacement, relay cropping and intercropping give scope for expansion of the legumes (Pala *et al.*). Breeding is an on-going effort for the usual range of qualities, while sustainability is very difficult to ensure under the vagaries of the environments in which cool season food legumes are usually cultivated. There is hardly a disease or other stress not touched upon, in no less than 43 papers, not counting the six on physiology including N-fixation.

The role of wild relatives in wide hybridization is reviewed again (Muehlbauer *et al.*, K.B. Singh *et al.*). Potentially major resistances to stresses are found in wild *Cicer*, *Lens* and *Pisum*. The major obstacle is obtaining hybrids beyond the primary genepool. For *Vicia faba*, still no relatives crossable with the cultivar have been found, despite close morphological likeness.

Stresses may be thwarted by integrated management systems (Nene & Reed) such as multiple host-plant resistance and improved agricultural practices. Components have been discussed to be considered and tested as integrated inputs.

Disease control by integrating various methods is clearly inventoried (Beniwal & Trapero-Casas). Cultural management, seed certification or at least field inspection and seed production in dry areas, rotation, perhaps soil solarization, are among the actions that can be taken. Robust, sustainable farming systems are needed, and 20–30 years may be required before legumes achieve their potential yield (Keatinge *et al.*).

Global climate change has, in general, positive net effects on productivity (of faba beans), CO<sub>2</sub> increase more than offsets ill-effects of temperature increase, as a crop growth model proves (Grashoff *et al.*).

In short, this volume is a veritable library, a mine of information, with many entries to earlier and/or more detailed literature. An indispensable summing-up, justifying the high price.

The next conference is planned for 1997. Steady progress is to be expected but no breakthroughs (Roberts, in the conference summary). The ILFRC concept will remain alive with an international steering committee and an organizing committee.

L.J.G. VAN DER MAESEN

## Exkursionsflora von Österreich

Wolfgang Adler, Karl Oswald and Raimund Fischer.

Ulmer, Stuttgart. 1994. 1180 pp, 510 Abbildungen. Hardback, DM 78.00; öS 550.00; sFr. 76.00 ISBN 3-8001-3461-6.

A flora that is to be used in the field is one of the few types of books that is almost fully defined at the outset, both in its layout and the setup of its contents. Small deviations from the traditional norm arouse strong reactions, both negative and positive. Perhaps the major freedom left to the author is the choice of its user group. This flora is for university level students and trained amateurs.

So you may expect a well-conceived book, with not too many but, in most cases, functional illustrations that are only marked with numbers to which reference is made from the text. This makes it hard to find out what is shown in a figure, especially when the corresponding text is several pages away. As in all German determination keys, abbreviations abound, but most of these are explained on the inside of the covers. In a few tests the keys worked properly except for a slight inelegance in the main key in the case of a gynodioecious species.

A useful detail is the underlining of those words in the text that point to particularly discriminative characters. Scientific names are accentuated for pronunciation. The ecological information is exemplary.

The authors have carefully considered the needs of their user group. This is evident from the unusually extensive introduction that covers a wide variety of topics: systematics, taxonomy and nomenclature, chorology, vegetation types, conservation and a good deal of morphology. An elaborate subject index facilitates the use of this part of the book. A fairly extensive selective bibliography of books, floras, red lists and journals also positively differentiates this book from many similar ones. Another welcome extra is the addition, for all major families, of a brief outline of the taxonomic structure of the group, listing all included genera.

Synonyms are listed, but not in great number. Moreover, all scientific names are presented without reference to the authors. This omission is perhaps the

single serious flaw of this book, because it will make a comparison with other, mostly older, botanical literature very difficult for those who have only this book to rely on.

The copious amount of text in this pocket-sized book has necessitated the use of a small print that impedes readability here and there. Otherwise, the design of the book is appropriate for its function, except for the light grey linen cover that will quickly reflect the intensity of its use.

The authors deserve a compliment for having undertaken such an extensive enterprise as the production, practically *de novo*, of a flora of this size.

A.C. ELLIS-ADAM

### Ecology and Management of Invasive Riverside Plants

Louise C. de Waal, Lois E. Child, P. Max Wade and John H. Brock (eds).

John Wiley & Sons, Chichester. 1994. x+217 pp. Hardback, Hfl. 163.55. ISBN 0-471-94257-X.

This book is announced as the first volume of the Landscape Ecology Series. The series will focus on problems that cause challenges to the landscape ecologist. This volume comes from a workshop on plant invasions and the role of rivers and streams. It was initiated by the International Centre of Landscape Ecology. Despite the suggestive broad title, the number of species on which data are presented is restricted to five: *Crassula helmsii*, *Tamarix* spp, *Heracleum mantegazzianum*, *Impatiens glandulifera*, and *Fallopia japonica* (= *Reynoutria japonica* = *Polygonum cuspidatum*). The main emphasis lies on *H. mantegazzianum*. Seven full and parts of four more chapters (out of the total of 20) are dedicated to this species. Consequently, there is much overlap in the introductory remarks on the biology, history of the introduction, and the toxic effects of this taxon. One summary introduction on these aspects would have served better. Another critical remark applies to the title of the volume. From the contributions, it becomes clear that in much of the area covered, Western and Central European countries, the species is not at all restricted (any more) to riverine habitats. In the non-mountainous regions of Denmark, Sweden, the Czech Republic, the UK, and (not mentioned in the book) The Netherlands, the species is rapidly spreading through a broad spectrum of man-made and abandoned habitats. The same holds more or less for *Fallopia japonica*. It must be stressed that, apart from these weak points, an enormous amount of information on the spread and the biology of the taxa is presented, including the first results from studies of the herbivory relationships, which suggest possible methods of biological control. This remark brings me to an overall impression the book

gives: it is mainly focusing on efforts to control, and possibly eradicate the taxa dealt with. Biological methods of control by grazing (by large and small herbivores) and by pathogens, and mechanical methods such as cutting are presented, but the main emphasis lies on chemical treatments. The book will be more satisfying for technical managers of landscape elements than for ecologists. In this context, I would like to plead for some caution in introducing possible control organisms from the home range of the species. There are already too many examples of new pests that arose from accidental introductions beyond the indigenous region.

*Fallopia japonica* is also treated in great detail: four chapters are fully and five partially dedicated to the species. The taxonomic treatment of the taxon deserves some criticism. As suggested above there are (at least) three synonyms for the taxon, the one used here is a new combination, not even mentioned yet in the 1993 edition of the *Flora Europaea*. The very concise remarks on the taxonomy in the most elaborate chapter 14, do not bring enough light in this complex matter. This holds the more because in another chapter, *Reynoutria* is used without any further explanation.

However, the same chapter by J.P. Bailey also presents an interesting study of the reproductive biology of this taxon, from which the reader learns, among many other facts, that apparently all the UK invasive material comes from a very limited (if not a single) introduction, and that reproduction within the species is exclusively vegetative; another example of the enormous dispersal power of a weedy species without sexual reproduction.

The two chapters on *Crassula* together present an overview of the biology and ecology, including a suggestion of the complete genetic uniformity of the material, and of the (chemical) control. Concerning *Tamarix*, the ecology and the control management practices, mainly in the SW of the USA, are presented. *Impatiens glandulifera*, another true riparian plant, is a.o. represented by a study of its seasonal dynamics in relation to co-occurring species as *Urtica dioica*, and by a modelling approach predicting its distributional response to future climatic change.

In conclusion, I regret to say that the statement on the back cover of the book that ... 'The latest scientific theories on plant invasions are presented ...' is more or less an exaggeration. Nevertheless, it must be said that the enormous amount of information presented here on some troublesome species is of great value for practitioners. From the information in this volume biologists and ecologists will generate many scientific questions that need to be answered in order to reach full solutions to the problems. However, I think that for this

intended readership the price will be a serious hindrance.

J.C.M. DEN NIJS

### **Plant Nutrition: From Genetic Engineering to Field Practice**

N.J. Barrow (ed.).

Kluwer Academic Publishers, Dordrecht. 1994.  
xxi+803 pp. Hardback, Dfl. 600.00 US\$364.00; UK  
£240.00. ISBN 0-7923-2540-0.

This sizeable book contains the plenary lectures and a selection of other contributions to the 12th International Plant Nutrition Colloquium, Perth 1993. As the subtitle suggests, the book covers a vast subject range providing a survey of the progress made over the past years. The charm of such compilations is the panoramic view over recent developments in a specific field, the drawback is the ephemeral character of some of the contributions. The latter disadvantage is mitigated by having the volume published barely half a year after the congress, which is quite an achievement in view of the number of authors involved.

Another achievement is that the editor has succeeded in convincing the authors of the need for a uniform format. Those who are familiar with the exuberant creativity of scientists in producing heterogeneous posters and poster abstracts cannot escape from the conclusion that the editor must be a persuasive and organized person. In addition to that, his task must have been onerous given the range of disciplines that had to be bridged. The joint efforts of authors and editor have resulted in a book which generally reads very pleasantly, no matter what subject is being treated.

It is not by chance that the attention is focused so much on the involvement of the editor. More than any other issue, a compilation of congress contributions is an editor's effort. The quality of such a book strongly depends on the editor's inventiveness in forming attractive categories that do justice to all papers. The organization makes or breaks the accessibility and attraction of the book.

One could argue about the classification policy being followed here. The first group of papers was clustered around the plenary lectures. The remaining papers were distributed over categories, the formation of which was guided by the traditional macro/micro nutrient terminology. With all the appreciation for the fact that scientific papers are hard to classify, I failed to understand the logic of the classification in several instances. Why, for instance, are there two small categories (membrane function, molecular biology), whilst most contributions in the molecular biology section are dealing with membrane transport

and one paper in the membrane function section deals with cDNAs?

This is a book with a wealth of information for researchers engaged in root physiology, plant nutrition and soil biology. Those who are keen to familiarize themselves with the present highlights in uptake and processing of soil-borne nutrients will be delighted to have this overview. Others who would prefer an in-depth introduction into the state of the art in soil science and plant nutrition will miss the integration that links the data acquired on the different organization levels.

A.J.E. VAN BEL

### **Physiology, Growth and Development of Plants in Culture**

P.J. Lumsden, J.R. Nicholas & W.J. Davies (eds).  
Kluwer Academic Publishers, Dordrecht. 1994.

xii+427 pp. Hardback, Hfl. 350.00; US\$199.00; UK  
£133.00; ISBN 0-7923-2516-8.

Micropropagation (vegetative propagation of plants via tissue culture) has major advantages over conventional vegetative propagation. The rate of propagation *in vitro* may be 100 or 1000 times larger than the rate *in vivo*. Moreover, micropropagated plants contain only few endogenous pathogens. When special care has been taken, micropropagated plants are even completely free of pathogens, including viruses. In spite of this, the commercial use of micropropagation has not expanded as rapidly as many expected. There are two reasons for this. First, the propagation rates of plants *in vitro* and the performance after transplanting tissue-cultured plantlets in soil are often still far from optimal. Second, micropropagated plantlets are expensive since micropropagation requires much manual labour. A conference held in Lancaster, UK, in September 1992 dealt with the first problem: the biology of micropropagation. Until recently, most research has been empirical. The book under review is based on the presentations during this conference and deals with the backgrounds of the problems. The book has been divided, somewhat arbitrarily, into two sections. The first section fills 200 pages and deals with nutrients, water and gas in tissue culture. The second section, also 200 pages, is on rejuvenation, contamination, morphogenesis and regeneration of roots, shoots and somatic embryos.

The topic of the book actually includes all areas of plant physiology. It is not surprising therefore that the book has many apparent omissions. To mention only some of these: the role of temperature, the question why some genotypes grow slowly and other genotypes fast, the occurrence of dormancy, bushiness of micropropagated plants after

transplanting, and the occurrence of epigenetic and genetic variation. Furthermore, most papers are research papers and give only a limited view on the state of the art in their field of research. Neverthe-

less, the book disseminates a wide range of information and may help to redirect the present research in micropropagation.

G.J. DE KLERK