

used in the book's compilation. Of the 69 references listed, 35 are in Czech or Slovak of which only three postdate 1973; 17 are in German with the most recent dated 1971; eight are in Russian with the most recent dated 1965; eight are in English with the most recent (except another 1982 book by the authors) dated 1964; and one is in French, dated 1965.

Over-all, the book is seriously flawed in philosophy, structure, and organisation, and is not up-to-date, even in non-English-language literature. It should not be used as a textbook. Nevertheless it does make available a summary of non-English work in a field in which little is published in English, and thus has significant reference value.

A. J. Pearce

PLANT BREEDING IN NEW ZEALAND

Edited by G. S. Wratt and H. C. Smith

Butterworths New Zealand, in association with DSIR, 1983. 309 pages.

ISBN 0-409-70137-8. NZ\$39.50

The book presents 34 articles, or chapters, in the names of 38 authors with 28 senior or sole authorships, which the editors managed to elicit without the inducement of air tickets. It addresses all areas of [higher] plant breeding in New Zealand, and finishes with a glossary, a cultivar index, and a general index.

The articles are organised into four sections: Cropping (eight articles), Horticulture (12), Forestry and Soil Conservation (three), and Pasture (11). The Cropping, Horticulture, and Pasture sections each begin with excellent overview chapters. Of the remaining articles, 18 are on single genera, nine on groups of genera, and four are on more general topics. The general topics are Novel Genetic Techniques in Plant Breeding (representing the one article that looks primarily to the future), Plant Breeding in the Seed Industry, Cultivar Management, and Breeding for Disease Resistance. At the end of each article is a brief list of Further Reading.

To finish with general vital statistics, there are 36 colour photos and about twice as many black and whites, plus a sprinkling of tables, graphs, flow charts, and line drawings.

The coverage of breeding has a strong historical emphasis, but with the help of the historical development there emerges a very clear picture of the present state of breeding and what varieties have been produced. Basic genetic principles are largely taken as read, but there should be few problems for the non-specialist reader. Much more emphasis is placed on the contexts in which the breeding programmes have developed. The statistics produced, while not heavy going, contain a formidable amount of reference information.

In keeping with the diversity of plant breeding, there are various historical threads. The contribution of the Department of Agriculture began in the 1890s with introductions which led into actual breeding. Lincoln College soon became involved, too, then Massey College, and various Government agencies have been joining in right up till the last few years. From very early days some private nurseries were doing their

bit, the classic contribution being that of Hayward Wright with kiwifruit. Since 1973, when the Plant Varieties Act was passed, there has been a sharp increase in the breeding work done by seed companies. The full impact of this Act remains to be seen.

For the foresters, the articles of immediate interest are those on Forestry by M. D. Wilcox and Soil Conservation by R. L. Hathaway and co-authors; indeed, Wilcox's article should be required reading. It gives a clear statement of what has been produced from the tree improvement programme at the Forest Research Institute and it should help dispel all-too-common misconceptions as to the respective roles and the interrelationships of tree breeding and cultural practice in crop improvement.

Readers in general, having opened the book, are liable to be enticed into reading a number of articles, although a cover-to-cover reading would be a tall order. In the excitement of the Horticultural Revolution various of the Horticulture articles will surely command wide interest.

The production of the book is handsome. The paper is glossy, and the attractive, large-page (A4), double-column format has given a lot of flexibility in the presentation of tables and illustrations. Printing and photographic reproduction are very good, and typos are commendably few. The standard of editing is high. Commendable, too, is the consistency of style, given the range of topics and the multiplicity of authors. There are, though, some cavils. The soft cover is regrettable. The lack of a cloth binding arouses some misgivings, although the pages are sewn and the binding does look reasonably robust. Many of the photos have more coffee-table appeal than hard information, and the potential to convey information is often vitiated by the lack of a scale. My copy had two leaves transposed, pages 174/5 with 225/6. There are occasional lapses among the captions. I feel that the glossary could have been improved by broader scrutiny. And it is there and in the Foreword and Introduction that the wide-page format has caused some problems.

It remains to examine critically the content of the book and to draw the main lessons that emerge. For this it is appropriate to note what the book does not achieve, although that in itself is not necessarily making criticisms. The achievements of the book will largely speak for themselves from the pages. The limitations may be less obvious, but should nonetheless be appreciated by the reader.

It is significant that, aside from a brief Foreword by the Minister of Science and a brief Introduction by the Editors, there is no attempt at a general overview. This should not be seen as a failing so much as a reflection of the sheer diversity of plant breeding work. Breeding programmes, while all beholden to the principles of inheritance, are always constrained by features of the particular organism, like the history of domestication, cultural systems, the fecundity, length of generation time, the breeding system, feasible propagation technology, and the traits in which improvement is desired. The upshot is that certain aspects of plant breeding, e.g., forest tree breeding with its selection methodology, have more in common with animal breeding than with plant breeding disciplines such as cereal breeding. That said, we should not reproach the editors for attempting to cover all plant breeding in New Zealand, because Nature does not tailor topics to the convenience of writers. The moral is that one should be

wary of trying to bring all plant breeding under a single umbrella of legislation, regulations, or management – it is all too easy to devise protocols which, while seemingly general, are really built around the constraints of a particular set of organisms.

One might add, though, that with new technology for propagation and genetic manipulation many constraints will doubtless go. This will make for new groupings with respect to breeding methodology for different organisms, but may not make plant breeding less diverse.

The main weakness of the book is in the organisation and coverage of the general topics. The article on Novel Genetic Techniques, for instance, has been tacked on to the section on Forestry and Soil Conservation. While it may have considerable application to trees it currently relates more to other types of plants. Additionally, the chapter is slanted (unlike the rest of the book) towards a general exposition of principles, and does not focus on what the future applications may be in the New Zealand context. Yet, looking into the future is a necessary exercise, even if it is a recipe for being wrong. The crystal ball motif on the cover implies some pretensions, but in respect of them the book has failed to deliver.

The other three general chapters are tacked on to the Pasture section. Two of them, namely Cultivar Management and Breeding for Resistance, have the limitations of incomplete or uneven coverage of various groups of plants. In fairness, it would be very hard to attempt even coverage, and the Breeding for Resistance chapter, after cursory treatment of principles, makes it clear that only examples are being considered.

Perhaps the biggest omission has been the cursory or incidental treatment of developments in vegetative propagation, such as tissue culture, which are less radical than actual genetic manipulation. This is doubly unfortunate in regard to forestry where, since the articles were prepared, advances in propagation technology have become an important element in forward thinking and even the present strategy.

Other omissions are inevitable, but I would have preferred a clearer indication in the Ornamentals chapter that breeding work on some genera was omitted.

Criticisms notwithstanding, the Editors and contributors are to be congratulated on a really excellent volume. Though changes may come thick and fast, the historical perspective will make the book of enduring value.

R. D. Burdon

FUELWOOD: THE ENERGY CRISIS THAT WON'T GO AWAY

by Erik Eckholm, Gerald Foley, Geoffrey Barnard, and Hoyd Timberlake.

Earthscan, 3 Endsleigh Street, London WC1H 0DD. 1984. 105 pages.

ISBN 905342-55-2. £3.50 (approx. NZ\$9.25)

For most New Zealanders fuelwood is not the stuff of an energy crisis. Hearing that term we are more likely to think of some aspect of the international oil market. Yet there are more than a hundred million people who already are unable to obtain sufficient