

between trees and grass (chapter 6), and the nutritive value of native pastures (chapter 9) are then described and discussed.

Management of native pastures is mentioned in most chapters and it is the major topic in four of them. Chapter 5 covers principles of pasture management and the utilisation of native pastures in different regions of Queensland, while others deal with managing tree and shrub populations (chapter 7), the role of fire in native pasture management (chapter 8), and augmenting native pastures with sown species (chapter 10). The integration of different feed sources is also considered (chapter 12). Landscape degradation is currently gaining wide publicity and is an issue of major concern in grazing areas; degradation of native pastures is covered in chapter 11.

There are three appendices including one containing useful data on the nutritive value of native pasture species at different sites and times.

The book is generally easy to read, although with so many authors (28) there are a wide range of writing styles. There are a considerable number of cross-references between chapters and the editors have done a good job in bringing out the inter-relationships between topics. The presentation is impaired by two minor but annoying print details. Some headings are in the same type face as the text and thus long headings can be difficult to distinguish, and the letter "i" frequently looks like an "l". The area of native pasture in Queensland is given as 154 M ha in the foreword and 151 M ha in chapter 1 — a misprint?

This book is an excellent collection of knowledge on native pastures in Queensland—it covers the topic well, includes an extensive reference list, and contains a good index. At the attractive price of \$20 it should be of interest to many pasture workers and a useful addition to libraries concerned with agriculture in Queensland.

J. G. McIVOR

*Tropical Pastures and Fodder Crops.* HUMPHREYS, L. R. Second Edition. Longman, Essex., 1987, 155pp., US\$14.95.

Professor Humphreys has done an excellent job of collating his wide ranging experience in many tropical countries with an extensive literature review. This is a very readable and well presented book designed for "diploma students, first year university students and extension workers". This second edition updates the first edition (reviewed in *Tropical Grasslands* 13:191) with some new information and a wider range of photographs.

The book is mainly concerned with a philosophy for pasture improvement involving various improved grass and legume species. Contents are arranged in six parts: (1) Natural Grasslands of the Tropics; (2) Approaches to Pasture Improvement; (3) New and Improved Pasture Plants; (4) Pasture Establishment; (5) Soil Fertility and Fertilizer Needs of Tropical Pastures; (6) Pasture Management and Productivity. Annual fodder crops are described in one of six sections in Part 3 and in portion of a section in Part 6. Thus, information on natural grasslands and fodder crops is fairly sparse.

A well balanced pasture improvement philosophy is outlined, but there are a few important deficiencies. For instance there is no mention of land capability assessments which should be the basis for designing environmentally stable tropical pasture management systems for individual farms. Another, is the sparse treatment given to nitrogen fertilised pastures both per se and their integration with other pasture types in whole farm systems. In the present cost/price situation, grass/N pastures would appear to be the most profitable pasture type on well drained lands in the high rainfall tropics of the Philippines, Malaysia, Mexico, Australia and possibly other countries. Discussion of grass/N pastures in turn makes it desirable to expand the section on grazing methods to discuss the convenience of rotational systems for

integrating different pasture types and different land classes on a whole farm basis.

There is a further serious omission in the section on the diagnosis of mineral deficiencies and toxicities (p.94). There is no mention of nutritional screening procedures, developed by the late C. S. Andrew, involving the use of nutritionally sensitive legumes as indicator plants. These procedures have been the key to successful development of grass/legume pastures on marginal lands in the high rainfall tropics of Australia, Malaysia and the Philippines.

Despite these limitations, the book is an admirable introduction to tropical pasture science for diploma and first year university students.

J. K. TEITZEL

*Dairy Cattle Research Techniques*. By J. H. TERNOUTH (Ed.) Queensland Department of Primary Industries, Brisbane. (1983), pp 366. \$28 hard cover, \$20 soft cover.

This review of techniques is a welcome contribution to the many problems associated with research on the dairy cow. The coverage of subjects in the present volume is almost encyclopaedic. A number of Australian specialists have contributed referred chapters on philosophy, methodology, husbandry, nutritional and physiological aspects of cattle experimentation.

Classical experimental methods are dealt with in an introductory chapter followed by discussions of planning and management of trials on dairy cattle. The main thrust of the book is its comprehensive presentation of husbandry techniques relevant to experimentation on calves, young cattle, and cows. A critically important chapter is that on grazing research. Substantial discussions follow on research into genetic improvement and in male and female reproduction. Thereafter milking research and milk hygiene are summarized: also an important chapter is devoted to sampling methods for milk, body fluids, tissues, infections and parasites. The issues here are important in their own right but also in their contribution to the growing awareness of the interactions of husbandry, nutrition, and health in research.

The philosophy of experimentation is taken up again with chapters on research objectives with emphasis on operational research, scientific literature, survey procedures, and the reporting of research findings. Two points regarding presentation formats and content are that these chapters could perhaps have been put with the earlier similar papers; also a chapter could have been included to discuss general problems of research; costs, labour demand, necessary deviations from optimal practice and hence reduced output from some stock in order to establish that optimal actual coefficients of variation, the merits of demonstration units, possibly also a brief comment on modelling. Comments on many of these points appear variously in the text but consolidation would be advantageous. Useful appendices are included on body scoring, nutrient requirements, and composition of feeds.

Careful editing has resulted in a clear, very readable book free from typographical errors. The book is pleasant to handle and will withstand a lot of usage.

The aim, to present cattle research techniques relevant to Australia, has been achieved but indeed has also been surpassed in a publication containing much of world wide research interest, application to species other than cattle, and benefit to good husbandry. The book's long term relevance will be fostered by the firm avoidance of discussion of today's research interests. It is essential reading for the post graduate specializing in dairy cattle research; for those already engaged in this topic it is a comprehensive refresher and reference book; and for field officers, lecturers, veterinarians, statisticians it is valuable collateral reading.

W. H. BROSTER