BOOK REVIEWS

HUMPHREYS, L. R. (1978). *Tropical Pastures and Fodder Crops.* Longman, London. 135 pp. Price $A5.35.

Tropical pasture research has provided technology for increasing animal production from about half the world's grazing animals. Implementation to a stage where sown pasture development has significant impact on animal production in many tropical countries is restricted by current socioeconomic circumstance.

Teachers, students, extension workers and producers concerned with the development and improvement of pastures in the humid and sub-humid tropics and sub-tropics will find that this book provides a comprehensive account, in subject matter if not detail, of principles and practices of pasture and animal production in these regions. The book, however, is most suitable for students in diploma and first degree courses studying tropical forage agronomy.

The glossary appearing at the front of the book suggests a more elementary content than presented. It is unlikely that a reader having difficulty with many of the terms defined in the glossary could adequately grasp the concepts and language contained in the text.

The contents are arranged in six parts. Discussion of natural grasslands (broadly defined as "any plant community which includes herbaceous species") is brief and readers are directed to a forthcoming companion volume in this Intermediate Tropical Agriculture Series, *Range and Wildlife Management* by H. F. Heady. It is stated that "The first requirement for the grassland manager is an understanding of the various factors affecting grassland change in his local area, and the signals which indicate whether the changes occurring are beneficial or harmful". However, Part 1 puts forward the viewpoint that "wherever it is economically possible, natural grassland should be replaced with selected sown species, or should have additional species grown with them". Part 2 summarises a philosophy of pasture improvement in which the manager must decide his production aims, understand the nature of the production processes involved, recognise the factors in the environment which can be changed, and arrange the efficient use by animals of the additional better quality feed grown.

In Part 3 desirable plant qualities for improved species are considered and the characteristics of many commercially used tropical pasture and crop plants illustrated. The suitability of plants for different climatic and soil conditions is outlined, and the principles of seed production are described. Pasture seed quality, environmental factors which limit successful pasture establishment, and agronomic techniques of pasture establishment in various situations are discussed in Part 4. Soil fertility, nutrients and fertilizer requirements, and the effects of added nutrients on botanical composition are treated in Part 5. Discussion on nutrient cycles in grazed pasture, the legume-*Rhizobium* symbiosis, factors affecting this relationship and its significance to ley farming systems conclude this section. The response of pastures to defoliation (grazing or cutting), determining the optimum stocking rate and factors influencing this, type of animal and grazing systems used, including those employing pasture conservation, and strategies for maintaining continuity of feed supply are topics discussed in Part 6.

There is an appropriate emphasis, in Part 3, on new and improved pasture plants which provide the basis for tropical pasture technology. Fodder crops command a small coverage, despite the book's title, although their roles in production systems are clearly explained. The comprehensive content pages and subject index permit easy access to topics discussed.

A few weaknesses, not necessarily the fault of the author, are described. Only three literature references after 1973 were noted which suggests considerable delay between initial preparation and publication. The old spelling of *S. guianensis* seems to confirm this. There was inconsistency in citation of references. Generally references to data presented in the text were provided alongside the data and were not included

in the references for further reading given at the end of each part. However, in Part 4 most literature references in the text were repeated at the end of this section. Printing errors were minimal and obvious. An apparently incomplete statement appears in an important paragraph, the last on p. 6, and although interpretable may confuse some readers. Two inaccuracies were noted; *Themeda australis* and *Heteropogon contortus* are both tolerant of fire (page 3) and secondly the process by which N is lost from dung and urine (page 11) is volatilisation rather than denitrification.

The author is Head of the Department of Agriculture at the University of Queensland. Dr. Humphreys has wide knowledge of tropical research and teaching acquired in several tropical countries and those interested in tropical pasture development will be grateful for the exposition of the subject provided in this book.

W. J. SCATTINI

HUMPHREYS, L. R. (1979). *Tropical Pasture Seed Production* (Second Edition), FAO Plant Production and Protection Paper 8, Food and Agriculture Organization of the United Nations, Rome. 143 pages (Free).

As this is the only book written about tropical pasture seed production, it is pleasing to see Dr. Humphreys and FAO producing a revised edition so soon after the initial publication in 1974. The author is also to be commended for maintaining his concise coverage of this diverse field despite the incorporation of additional material.

The rapid progress being made and the worldwide interest in tropical pasture seed production is underlined by the fact that another 110 references from 22 countries have been included. This has added many details to the first edition (reviewed in *Tropical Grasslands* 9: 75), but the structure remains essentially the same. After an initial summary, the book begins with a short discussion of the physiological limitations to seed production before setting out the broad principles involved in the selection of suitable sites, in crop establishment and management, and in harvesting and processing of the crop. This is then rounded out by brief notes on seed quality and on the seeding characteristics of the main tropical grasses and legumes.

The major chapters have been sensibly arranged to follow the sequence of practical operations, although drying should logically come immediately after harvesting and storage after packaging. Grasses and legumes, however, should be discussed separately. The combination of these two disparate groups for most purposes may avoid covering any common ground twice, but does not give proper emphasis to their many differences with regard to seed production. Moreover, it is not always clear if the author is referring to both groups or only one and gaps in our knowledge tend to be obscured where there is data pertinent to only one group.

Brevity has been achieved by drawing out principles and by discussing selected examples in more detail, though some terms and results have occasionally been accepted rather uncritically and published work has sometimes been listed rather than collated. For a critical review of literature, clearly defined terminology should be included at the outset because research papers on tropical pasture seed production are often traps for unwary readers. For example, terms such as seed set are variously and often vaguely defined in the literature and it is not always clear whether rates of fertilizer are on an annual or a "per crop" basis.

Grasses and legumes have been discussed separately in the detailed sections on fertilizer nitrogen. For completeness, however, these should be expanded to cover the various commercial formulations available and, if possible, to consider alternative response functions since the choice here can affect the position of experimentally determined optima more than is often realized. In addition, economic data would be more useful than statements that quite high levels of fertilizer are "profitable" or "usually economic".

In this edition, more attention has been given to the simple techniques necessary in less developed countries, though more emphasis again could be given in the future.