

BOOK REVIEWS

Nitrogen cycling in South-East Asian wet monsoonal ecosystems. Ed. by R. Wetselaar, J. R. Simpson and T. Rosswall (1981) ISBN 0-85847-097-7 Australian Academy of Science, Canberra. vii + 216 pp. (108 tabs, 52 figs) Hardback A\$25.00, plus postage—within Australia A\$1.50, overseas A\$3.00 (Available from Executive Secretary, Australian Academy of Science, P.O. Box 783, Canberra City, A.C.T. 2601, Australia).

This book contains proceedings of a Regional Workshop arranged by the SCOPE/UNEP International Nitrogen Unit of the Royal Swedish Academy of Sciences and the Chiang Mai University, sponsored by the Man and the Biosphere (MAB) programme of UNESCO and the National Research Council of Thailand, and held at Chiang Mai, Thailand, 5–10 November, 1979.

Appropriately, half of the thirty-four papers in the book are devoted to rice, the most important food crop in the region. The first paper is a review of nitrogen cycling in wetland rice. The other papers in the first half of the book report experimental data for nitrogen fixation, recovery of fertilizer nitrogen and transformation and balance of soil and fertilizer nitrogen in rice cropping systems.

The second half of the book includes papers on aspects of nitrogen cycling in plantation crop-legume cover crop ecosystems, tropical rain forests, mangroves and peat deposits, nitrogen fixation by *Neptunia oleracea*, decomposition of nodules and roots of *Centrosema pubescens*, and the role of *Casuarina* under shifting cultivation. There are a further three interesting papers which are related to environmental problems associated with parts of the nitrogen cycle, and three dealing with modelling and methodology. The contributed papers conclude with a bibliography containing 92 references on nitrogen in precipitation in south-east Asia and adjoining areas (including Australia). Next are the reports of five Work Groups. These deal with nitrogen cycling in four types of systems (irrigated wetland rice, forests and plantation crops, catchments, and shifting cultivation) and with the relevance of the nitrogen cycling studies to the MAB research programme of the region. Problems and priorities for research in the four types of systems are listed in the reports, but only the Work Group for Wetland rice was able to construct a detailed balance sheet of nitrogen inputs and losses.

The book is intended for scientists with an interest in nitrogen cycling, and although half of the book is concerned with rice cropping systems, grassland scientists who have an interest in nitrogen cycling will find much information of general applicability that they can relate to grasslands.

I. VALLIS

Assessment of the agricultural and pastoral potential of Queensland. E. J. Weston, J. Harbison, J. K. Leslie, K. M. Rosenthal and R. J. Mayer (1981) ISBN 0-7242-2143-3. Published by Queensland Department of Primary Industries, G.P.O. Box 46, Brisbane, 195 pp, A\$20.00 plus postage (A\$4 intrastate, \$8 interstate, \$6 overseas)

One of the major needs when planning research and development programmes is to know just what areas of land one is dealing with and to which areas the results obtained will be applicable. The present volume therefore is most useful to people so charged in Queensland. Whilst numerous regional land use surveys have been carried out within the State this is the first such survey for the whole state. The Atlas of Australia Soils provides a uniform base for this assessment. It was implemented by using field officers of the Divisions of Plant Industry and Land Utilization of the Department of Primary Industry to assess the potential agricultural and pastoral use of each unit of land as mapped in the soils atlas.

No attempt was made to limit assessments of potential to those which may be realized within a defined time, so social and economic pressures were removed. The

assessment then became essentially one of soil type, climate and land form subject to current technology.

The book outlines in Part I the methods used, which relied heavily on computer coding and extraction of data, the overall potential classifications, and discusses trends in development of crop and pasture potential. Part 2 indicates how the computer stored data may be accessed. The data base covers 3282 land units in 114 shires in Queensland.

The report is accompanied by four wall maps covering (i) crop potential (ii) sown pasture potential (iii) native pasture communities (iv) dominant land suitability, each at a scale of 1:2 500 000 and a series of microfiche appendices. These provide data on potential and current land use at land unit, shire, regional and state levels of assessment. This information is also provided for vegetation zones, native pasture communities and soil texture groups. Additionally on microfiche are statistics for gross and net crop, sown grass and sown legume potential and a listing of the basic data available.

As the summary says "This report contains information for government and industry administrators, for research planners and for educators. Many facets of the States natural resources are quantified in the statistics". On the broadest scale the Queensland land resource of 172.8 m ha provides a cropping potential of 14.2 m ha annually (presently 2.1 m ha used); a sown pasture potential of 40.6 m ha (currently 3.9 m ha developed). With full development of these the present 154.8 m ha native pastures would contract to 105.9 in ha. As these types of data are shown shire by shire and land unit by land unit their availability have a major impact on the states future development.

D. G. CAMERON

Terrestrial Nitrogen Cycles, Processes, Ecosystem Strategies and Management Impacts.—Eds. F. E. Clark and T. Rosswall, 1981. ISBN 91-546-0290-4. Ecological Bulletin (Stockholm) No. 33 709 pp. Sw. Kronor 250

This publication is based on the proceedings of an international workshop held in Sweden, September 1979, sponsored by the SCOPE/UNEP International Nitrogen Unit of the Royal Swedish Academy of Services and the Commission for Research on Natural Resources of the Swedish Council for Planning and Coordination of Research. The seven-hundred odd pages of the book are organized into forty-one chapters excluding the nine chapters that comment on each group of presented papers. The chapters are organized into four sections namely Introductory Papers, Processes, Ecosystem Strategies and Management Impacts.

The publication is a well balanced mixture of technical and review articles and although it would be of most value to those actively involved in the field, I (a legume bacteriologist) found it very interesting, informative and readable. Each section of the book is logically linked to those preceding and following it.

The Introductory Papers provide an imaginative overview of the history and state of the art of N-cycling, together with a major emphasis on modelling with one article which attempts to integrate both the carbon and nitrogen cycles. If one of the aims of modelling is to raise questions and to indicate the areas where data is lacking, this has been constructively achieved by the Introductory Papers.

The breadth and depth of the topics covered in the section on Processes is impressive as all the major mechanisms of the N cycle are critically discussed. The physical and biological avenues by which nitrogen can enter and leave a cycle are evaluated and articles are presented on the fixation of ammonium to soil particles, the mobility of the ammonium ion in soil and the mineralization of organic matter and the role of soil fauna in this process. The section contains comprehensive articles on ammonia volatilization, nitrification, denitrification and a chapter by J. M. Tiedje *et al.* which contains a simultaneous investigation into assimilatory and dissimilatory