

Book review

Field and Laboratory Methods for Grassland and Animal Production Research

Edited by L. 't MANNETJE and R.M. JONES. Published by CABI Publishing, Wallingford, Oxon, UK, 2000. 447 pp. Price £65. ISBN 0 85199 351 6.

Measurement of Grassland Vegetation and Animal Production, by L. 't Mannelje, the predecessor of the book under review, is a valuable and much used book on the library shelves of many universities where grassland science is taught. With this book, 't Mannelje and Jones went a step further and increased the scope, to include topics like modelling, remote sensing, sociology and rangeland monitoring. In the preface to the book, 't Mannelje stated that "this is not a book of recipes, but rather an introduction to grassland ecosystem and animal production research methodology and a guide to the available techniques". Chapter 1 "Grassland Vegetation and its Measurement" by 't Mannelje and Jones is a short introduction with numerous references to following chapters.

In Chapter 2, Kelly and Basford give an overview on pattern analysis and discuss processes like clustering, ordination and networks. A practical example, to illustrate how classification and ordination procedures can complement each other, is discussed. This is followed, in Chapter 3, by a review of the structure and application of models of pasture and animal production by Rickert, Stuth and McKeon. They also give an introduction to the modelling of pasture and animal production by describing simple sub models.

Chapter 4 by Whalley and Hardy deals with measuring botanical composition of grasslands. They discuss the different sampling strategies as well as the pros and cons of different techniques in estimating diversity and species richness, cover, density, frequency and composition by mass. The next chapter by Laca and Lemaire on the measuring of sward structure, discusses the influence of structure on growth and grazing briefly and then continues with a discussion on the merits of the different methods used in measuring vertical as well as horizontal structure.

Hay, Jones and Orr discuss the phenomenon and measurement of plant population dynamics in grasslands in Chapter 6 in 3 main topics. The first topic is the demography of the sexual reproductive pathway, where the focus is on survival of the mature plant and the measurement of seed set, seed fall, seed banks and seedling establishment and survival. Under the second topic, the demography of clonal species, the reader's attention is focussed on clonal growth, changes in the genetic composition of populations, clonal demography at the phenotype level, population density and population

fluxes. The third topic is the use of demographic studies.

Chapter 7, by the editor, and 8 by the editor and Schultze-Kraft are devoted to the measurement of biomass and DM yield in grassland vegetation and the evaluation of species and cultivars.

The principles and practices of remote sensing, a subject very often mentioned in the other chapters on grassland evaluation, is discussed by Roderick, Chewings and Smith in Chapter 9. A chapter in which Friedel, Laycock and Bastin discuss the assessment of rangeland condition and trend by both ground-based and remote-sensing methods follows. They discuss why rangelands change, what happens during such change and how can, or should, this change be modelled (Clementsian succession *vs* the state-and-transition method), and conclude with a discussion on the merits of different methods for range monitoring.

Adesogon, Givens and Owen discuss the merits of the different methods for the measurement of chemical composition and nutritive value of forages in Chapter 11.

Methods for determining the physical, chemical and biological soil parameters, by Bouma, Curry and Houba, and the measurement and monitoring of nitrogen and phosphorus in grassland systems, by Jarvis and Oenema, are discussed in Chapters 12 and 13.

The discussion of the layout of experiments with animals and the measurement of animal performance in Chapters 14 and 15 by Bransby and Maclaurin and Coates and Penning, respectively, is a logical conclusion to a book on grassland research. The problems encountered by researchers working in third world countries necessitate the inclusion of a chapter on the development-oriented socio-economic methods, in which some valuable hints on the subject are given by means of a number of case studies.

I consider this book to be a valuable source of information for postgraduate students. It is not a book of recipes, however. All subjects are well referenced with a wealth of references at the end of each chapter. 't Mannelje succeeded in putting together a compilation of knowledge, using experts in various fields of research. One point of critique may be the sequence of the chapters. I personally think that subjects like Pattern Analysis (Chapter 2) and Modelling (Chapter 3) should have been the closing chapters. The other big problem is the price. At £65 a copy, it will be out of reach of many postgraduate students, especially those in the developing countries of the world.

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