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Book reviews

Nitrogen Leaching in Ecological Agriculture, ed. L. KRISTENSEN WITH C. STOPES, P. KØLSTER, A. GRANSTEDT & D. HODGES. x + 343 pp. Bicester: AB Academic Publishers (1995). £59.00 or $99.00 (paperback),
ISBN 0 907360 24 6.

This book contains 28 papers presented at a workshop held in Copenhagen in October 1993. The papers are grouped round four themes – farming systems, crops and rotations, nitrogen dynamics and manuring strategies, with a final section giving a summary and recommendations.

There is an unresolved problem at the heart of the book. Ecological agriculture is defined (p. 332) as '… a sustainable approach to agricultural production. In ecological agriculture each farm aims to reduce outside inputs, whilst improving soil and other environmental conditions.' This is an aim almost everyone could agree to – whatever their position along the 'organic' to 'conventional' continuum. For example, one of the aims of high-technology precision farming is to avoid wasteful use of fertilizers and other agrochemicals when working large non-uniform fields. However, some of the authors take matters further, by equating ecological agriculture with organic farming, in which synthetic biocides and nitrogen fertilizers are declared to be bad *by their very nature*. This takes the argument from matters of science and economics to matters of dogma – a distinction to be kept in mind when reading certain papers in this book.

The whole book (and, for that matter, most contemporary discussions of nitrate leaching) is fixated on the World Health Organization and European Union limit of 11·3 mg NO_3-N per litre of drinking water. But the medical evidence behind the choice of this particular limit is looking increasingly shaky. Nitrate in the human diet is concentrated in the saliva and reduced in the mouth to nitrite, which gives marked protection against gastroenteritis. A certain amount of nitrate may even be beneficial. We need to reassess the present limit on the basis of modern medical research. Nitrate can cause eutrophication of surface waters and a new limit might have to be based on this – but if eutrophication proves to be the critical factor, the limit should then be based on environmental, not medical, grounds.

All farming systems leak nitrate, and nitrate leaching can be particularly difficult to constrain in mixed systems involving housed animals (p. 66), where the application of manure and, more importantly (p. 323), of slurry to arable crops can result in considerable leaching. Pasture is inherently less leaky than arable land but leys, once ploughed, release a flush of mineral nitrogen (p. 23). It is clear from the papers in this book that the gainful use of the whole of this flush is still an unresolved problem in ecological agriculture.

There is much useful information in this book, mainly gathered from small mixed farming systems in Scandinavia and Western Europe. Setting aside a certain amount of wishful thinking on the benefits of organic agriculture, the book addresses issues much wider than nitrate leaching, issues that face farmers, agricultural scientists and administrators alike – how to provide a decent living for the farmer in a way that is sustainable and minimizes damage to the environment, at the same time providing cheap and wholesome food.

D. S. JENKINSON

Herd Health and Production Management in Dairy Practice, eds A. BRAND, J. P. T. M. NOORDHUIZEN & Y. H. SCHUKKEN. viii + 543 pp. Wageningen: Wageningen Pers (1996). NLG184.00 (paperback). ISBN 90 74134 34 3.

This book attempts to provide a manual for veterinarians and farm advisers on the improvement of herd health and production on dairy farms. With the control of most of the major infectious diseases achieved, at least temporarily, much attention is justifiably given to production diseases and the improvement of dairy cow management. The book provides specific detail on the management of nutrition and reproduction, udder and foot health, infectious diseases and rearing heifer replacements. Unfortunately, most UK veterinary students will not have the time to study one species in such detail and they may be put off by the repetitive nature of some sections of the book, in particular those detailing principles of herd health monitoring.

The book advocates the use of copious scoring systems, from the normal body condition scores to teat end keratinization scores, feed bunk condition scores and even scores for the farmer's scoring ability. While some of these are undoubtedly valuable when specific problems arise, it is unlikely that many farmers will have the time to use them routinely and advisers may prefer to use their own experience. Some chapters are good at setting quantitative targets, e.g.

for heifer growth rates, even if these are for large Holstein cattle. In general, the book is oriented to intensive dairy farms in the USA and the Netherlands, where most of the chapter authors come from. An attempt to broaden the scope of the book is made by including a rather weak chapter on herd health management in developing countries. By the authors' own admission there is no general prescription for dairy herds in developing countries and it would have been better to encourage the other chapter authors to be less parochial. They often lapse into local terms, such as 'slug feeding' and 'springing heifers' and, in places, the quality of the English is appalling. There are copious spelling mistakes (six on one page) and in places some authors write in note form. Tables and Figures are often difficult to understand, references are listed at the end of some chapters but not others, and the index is very limited. Most of these annoying features of the book should have been dealt with by the editors.

There is also considerable variation in quality between authors, as is often the case with edited books of this nature, and their brief appears to have been imprecise. Some concentrate on recording methods and others on the underlying science. For example, some nutrition sections are informative but others contain largely practical advice that would be difficult to substantiate, e.g. 'when little feed is left, cows will consume 50% of what is left'. An uninitiated veterinary student would be left with the impression that there is little science in dairy farming. Concerning minerals, basic errors are made – potassium is not an anion! The reproduction sections are good in parts but contain nothing on oestrus detection aids. Infectious diseases are not covered well; only examples of the aetiology and treatment of some major pathogens are given. There is no mention of BSE in the whole book!

Unfortunately the length of this book and its poor preparation will restrict its usefulness. Those wishing to make a career of advising dairy farmers will probably find it worth consulting but quite frustrating to read.

C. J. C. PHILLIPS

Cool-Season Forage Grasses, eds L. E. Moser, D. R. Buxton & M. D. Casler. xix + 841 pp. Agronomy Monograph 34. Madison, Wisconsin: American Society of Agronomy Inc., Crop Science Society of America Inc., Soil Science Society of America Inc. (1996). $59.40 (hardback).
ISBN 0 89118 130 X.

This is a multi-authored, research-based reference book. It seems to be directed primarily at North American readers, but there is much that is useful for readers in other parts of the world where cool-season grasses are grown.

Altogether there are 66 authors. Twenty of these are from the States of Utah, Nebraska, Iowa and Pennsylvania; 36 are from 22 other States of the USA, five are from Canada, one from Australia, two from New Zealand, one from the Netherlands and one from the UK.

There are twelve chapters (40% of the book) dealing with particular grasses: principally *Festuca arundinacea*, *Dactylis glomerata*, *Bromus inermis*, *Bromus riparius*, *Phalaris arundinacea*, *Phalaris aquatica*, *Lolium perenne*, *Lolium multiflorum*, *Phleum pratense*, *Poa pratensis*, wheatgrasses, wild ryes, *Alopecurus pratensis* and *Alopecurus arundinaceus*. The preceding 14 chapters (60% of the book) deal with general issues relating to cool-season forage grasses: seed, establishment, physiology, water relations, nutrition, pests, forage quality, ecosystems, hay, silage, pasture, rangelands, seed production and plant breeding.

Almost all the chapters are by at least two authors and most have authors from at least two States or countries. The only chapters which include an author from outside North America are those on ecosystems, *Phalaris* and *Lolium*. Nearly all the authors are from a University or from a Government-funded research service.

The text is well supplied with supporting references, as in review articles. The reference lists at the end of each chapter occupy more than 150 pages and include some 4000 references which are predominantly fairly recent. Judging from the most recent references in the list, chapters were written at slightly different times, ranging from about 1992 to 1995. Some work from the early decades of the 20th century is included where appropriate. The earliest reference I noted was 1868 (Darwin, C.). The authors cited include a good number from the UK.

The book is No. 34 in a series of agronomy monographs, which has included so far two on turfgrass, two on alfalfa, one on tall fescue and one on clover. The purpose of No. 34, according to the foreword, is to 'serve as a reference for educators and students, investigators and practitioners, crop scientists and soil scientists, ornamental horticulturists and turf specialists, environmentalists and conservationists', as well as all other persons interested in the various topics covered.

It must have been a considerable task to assemble all the material in the book. Few people will attempt to read the whole book, but many will find it a valuable source of information on particular topics and certainly it should be in the relevant libraries. The standard of writing is acceptable; inevitably, perhaps, the text is rather heavy going in places and not always as clear and perceptive as it could be. The standard of editing and proof-checking is acceptable, although not perfect.

DAVID WILMAN

Genetics, Cytogenetics and Breeding of Crop Plants. Volume 1. Pulses and Oilseeds, eds P. N. BAHL & P. M. SALIMATH. viii + 313 pp. Lebanon, USA: Science Publishers Inc. (1996). £70.00 (hardback). ISBN 1 886106 59 2.

This book uses specific crops as case studies of genetics, cytogenetics and breeding. Among pulses, there are multi-authored chapters on chickpea, pigeon pea, lentil and mungbean; and among oilseeds the crops soyabean, groundnut, rapeseed, mustard and sunflower are covered. Each chapter covers origin and distribution, taxonomy, morphology, cytology, genetics and genetic improvement and ends with a section on future research needs. The individual chapters are useful reviews of the 'state-of-the-art' of genetics, cytogenetics and breeding. However, the 'state-of-the-art' is out-dated in some cases. For example, in the lentil chapter there are 145 citations in the reference list and only two are dated after 1990. It is as if the book had been 'deep-frozen' for five years. This is unfortunate because advances in DNA technology have and are being applied to the improvement of the crops mentioned and this research is barely touched upon.

The choice of pulses covered in the book is biased strongly toward their importance in India. I have no problem with this, but it limits the usefulness of the book outside the sub-continent. The most important pulses globally are dry bean and pea, with respective 1995 world production of 18 and 11·5 million MT. By comparison, among the crops covered in the book chickpea has the largest production, totalling 8 million MT in 1995. I found the index substandard, annoyingly inadequate in coverage and arranged by chapter. In summary, the book serves as a useful summary of classical crop improvement of key S. Asian pulses and also the most important oilseeds globally.

W. ERSKINE

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