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BOOK REVIEWS

Analysis of Variance and Covariance: How to Choose and Construct Models for the Life Sciences. By C. P. Doncaster and A. J. H. Davey. Cambridge: Cambridge University Press (2007), pp. 302, £65.00 (hardback), £25.99 (paperback). ISBN-13:978-0-521-86562-3 (hardback), ISBN-13:978-0-521-68447-7 (paperback). doi:10.1017/S0014479708007254

This book presents details of the analysis of variance for a compendium of designs with up to three treatment factors. The book has a good discussion of practical situations where each design may be useful, ranging from the authors' interests in ecology to more conventional examples from agricultural and medical research. It shows schematic plans of the type of data that will be collected, and the analysis of variance tables that should be generated. It also contains good advice about assumptions and interpretation of the analysis. It should thus be an invaluable reference for the target audience of post-graduate researchers. I do, however, have some concerns. The book requires considerable prior knowledge of design and analysis of variance, and has a tendency to use concepts before they are explained. Having a PhD in statistics I found this an interesting challenge, but a recent (non-statistical) MSc graduate soon became confused and discouraged. Nevertheless, the concepts are nearly all explained somewhere in the book, so persistence would be rewarded. More importantly, though, I am sceptical about the concept of a compendium of specific examples, and would have preferred to see more attention given to the underlying principles of design and anova, such as randomization, blocking and treatment structures. Readers would then be able to generalize the ideas, for example, to four-factor designs or to some of the omitted three-factor designs such as Latin squares with split plots. Nevertheless the book has many strengths and I am happy to recommend it.

Roger W. Payne

Modeling Crop Production Systems. Principles and Application. By P. Singh, Enfield NH, USA: Science Publishers (2008), pp. 512, £33.30 (paperback). ISBN 9-781578-084180. doi:10.1017/S0014479708007266

This is a book aimed at a broad church but, in my view, is most suited to numerate agronomists with an interest in the use of computational methods at the more applied end of science. The nature of the area demands a wide range of techniques and Singh's book bravely attempts to cover the key elements in one volume. Thus, there is a need to strongly focus on the most relevant elements and avoid the temptation to cover too many topics in insufficient depth, and it is here that I thought the book fell a little short. For example, in my view this book spends too much time on computer implementation and not enough time on analysis. Programming style, languages and pieces of code are a matter of experience and taste, and are also quickly outdated. Analysis techniques are less subjective, evolve more slowly and are key to reaching a better understanding of what we observe. That is not to say that Singh ignores this aspect, however, I doubt if the depth is sufficient to inform the student to a level where she/he could apply the techniques without the need to resort to other books. That said, the later chapters covering numerous examples of applications are a a particular strength of the book. The book refers to the 1984 edition of *Mathematical Models in Agriculture* by France and Thornley. Students considering moving in to this area might usefully compare Singh's book to the more recent 2007 edition of France and Thornley.

John Crawford

Climate Change and Agriculture in Africa. Impact Assessment and Adaptation Strategies. Edited by A. Dinar, R. Hassan, R. Mendelson, J. Benhin and Others. London: Earthscan/Centre for Environmental Economics and Policy in Africa (CEEPA) (2008), pp. 189, £49.95. ISBN 13:-978-1-84407-547-8. doi:10.1017/S0014479708007278

The goal of this book was to develop multipliable analytical methods and procedures to assess quantitatively how climate affects current agricultural systems in Africa, predict how these systems may be affected in future by climate change and suggest what role adaptation should play.

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A highly ambitious project in which 44 authors and many more who were involved in detailed data collection and analysis provided six main chapters: Introduction and Rationale: Objectives, Methodology and Organisation: Methods and Models Used; Country Analyses; Regional Analysis: Summary and Conclusions, and two annexes: Literature Review on Adaptation in Agriculture, and the Household Questionnaire.

Methodologies used included cross-sectional Ricardian analysis, a structural Ricardian analysis, CROPWAT and CROPWATCC, and a farm household survey which was conducted in 11 countries with a total of 9598 households. Weather data, crops, livestock, soils and hydrological data were also collected from each country.

Synthesizing so much data for the whole continent in one, relatively short, book is very difficult and has not been entirely successful. The graphs and diagrams are not always clear and the continent-wide maps are not very effective at such a scale.

The outcome should be of interest to many followers of modelling on this scale, but the most interesting information could be on the amount of adaptation that farmers have been undertaking. The concluding chapter is too brief and superficial to be of any general value and reflects a mindset embedded in the conventional economic order and does not acknowledge the need for alternative economies and ecologies that might be based on farmer knowledge and new partnerships for innovation and change.

David Gibbon

Integrated Watershed Management: Connecting people to their land and water. By H. M. Gregersen, P. F. Ffolliott and K. N. Brooks. Wallingford: CAB International (2007), pp. 288, £35.00. ISBN 978-1-84593-281-7. doi:10.1017/S001447970800728X

In a period of looming food crises, land disputes and water shortages a comprehensive overview on integrated water management (IWM) is timely and appropriate. The authors go to great length to cover just about every subject related to IWM in a holistic and exhaustive way, trying hard to explain such a complex issue. The subjects covered include challenges and opportunities; land use, water management and cumulative effects; institutional context; planning and policy making; hydrological processes and technical aspects; monitoring and evaluation to improve performance; research, training, information and technology transfer; and concluding thoughts on adaptive and integrated management of watersheds.

Every chapter provides detailed information, such as, the distinction between a conference, symposium, seminar and workshop, which is explained in the chapter on research, training, information and technology transfer.

I have little criticism of the book, except that the authors go astray when they step outside their own discipline. A statement that trees protect soils against erosion is simply not true. The management of trees and their spatial arrangement, like forests, can indeed prevent erosion. Individual trees, however, do not and can even aggravate erosion. Also, a list of acronyms would have been useful, certainly for those who are not conversant with watershed management in the USA. However, despite these small inconveniences the book can be considered as an asset for those who want to know more about IWM, because it touches upon about every subject related to it. It can be highly recommended as a textbook for undergraduate teaching and as a reference guide for people working in IWM or related areas.

Paul Kiepe

Soil Science Simplified (Fifth Edition). By N. S. Eash, C. J. Green, A. Ravi and W. F. Bennett. Ames, Iowa: Blackwell Publishing (2008), pp. 246, £29.99. ISBN-13: 978-0-8138-1823-8. doi:10.1017/S0014479708007291

This book follows the usual pattern for soil science textbooks with chapters on soil formation, soil physical, biological and chemical properties, soil water, temperature, fertility and plant nutrition, management, conservation, classification and uses. As an introductory text it is well written, adequately illustrated, pleasantly readable, and contains both a useful index and glossary. Only the American Soil Taxonomy system of classification is described, which may reduce its usefulness to Europeans and other users of the FAO system. The absence of colour plates is a particular drawback here.

The authors suggest the book as an introductory text for high school courses in agricultural science and for university students of natural and earth sciences, which is about right, although outdated units like microns and angstroms have been left in and the coverage is fairly basic. The coverage of soil water, for example, goes only so far as the concept of available water but with no mention of water or matric potential, of water release characteristics, or of the concept of hydraulic conductivity. This is a basic, user-friendly book that covers soil science from a predominantly agricultural and applied perspective with the minimum use of technical

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