

CONTENTS

Foreword	vii
Introduction	ix
Acknowledgments	xi
A Statistical Fable. The Story of a Grumpy Ox Barry Glaz	xiii
CHAPTER 1. Errors in Statistical Decision-Making Kimberly Garland-Campbell	1
CHAPTER 2. Analysis of Variance and Hypothesis Testing Marla S. McIntosh	19
CHAPTER 3. Blocking Principles for Biological Experiments Michael D. Casler	53
CHAPTER 4. Power and Replication—Designing Powerful Experiments Michael D. Casler	73
CHAPTER 5. Multiple Comparison Procedures: The Ins and Outs David J. Saville	85
CHAPTER 6. Linear Regression Techniques Christel Richter and Hans-Peter Piepho	107
CHAPTER 7. Analysis and Interpretation of Interactions of Fixed and Random Effects Mateo Vargas, Barry Glaz, Jose Crossa, and Alex Morgounov	177
CHAPTER 8. The Analysis of Combined Experiments Philip M. Dixon, Kenneth J. Moore, and Edzard van Santen	201
CHAPTER 9. Analysis of Covariance Kevin S. McCarter	235
CHAPTER 10. Analysis of Repeated Measures for the Biological and Agricultural Sciences Salvador A. Gezan and Melissa Carvalho	279
CHAPTER 11. The Design and Analysis of Long-term Rotation Experiments Roger William Payne	299
CHAPTER 12. Spatial Analysis of Field Experiments Juan Burgueño	319

CHAPTER 13. Augmented Designs—Experimental Designs in which All Treatments are Not Replicated	345
Juan Burgueño, Jose Crossa, and Kathleen M. Yeater	
CHAPTER 14. Multivariate Methods for Agricultural Research	371
Kathleen M. Yeater and María B. Villamil	
CHAPTER 15. Nonlinear Regression Models and Applications	401
Fernando Miguez, Sotirios Archontoulis, and Hamze Dokoohaki	
CHAPTER 16. Analysis of Non-Gaussian Data	449
Walter W. Stroup	
APPENDIX A.1. Author Supplements	A1
APPENDIX A.2. Author Supplements	Online only
APPENDIX B. Genstat Translation	Online only
Vanessa Cave	
APPENDIX C. R Translation	Online only
Jon Baldock and Kimberly Garland-Campbell	

Supplemental materials are available in Appendix A and online at <https://dl.sciencesocieties.org/publications/additional-appendices-app-stats>. These materials include answers to review questions and exercises, datasets, software code in SAS (SAS Institute, Cary, NC), R (CRAN, www.r-project.org [verified 23 Apr. 2018], and Genstat (VSN International LTD., Hemel Hempstead, UK) along with output from these software products. Most chapters utilize SAS software code to illustrate the examples within the chapter text, with R and Genstat also utilized, depending on the authors' preference. Supplemental Appendices are available online for R and Genstat translations where applicable. A great voluntary effort was undertaken to provide software code for all examples in the three major languages used in this text.