

## BOOK REVIEWS

### Einführung in die Biometrie

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*Price per volume without value-added tax and postage 7 €, price for all four volumes 25 €.*

Volume 1: CH. RICHTER: Grundbegriffe und Datenanalyse. 160 pp. ISBN 3-930037-15-7  
Volume 2: D. SUMPF, E. MOLL: Schätzen eines Parameters und Vergleich von bis zu zwei Parametern. 134 pp. ISBN 3-930037-16-5  
Volume 3: E. SCHUMACHER: Vergleich von mehr als zwei Parametern. 184 pp. ISBN 3-930037-17-3  
Volume 4: D. RASCH, R. VERDOOREN: Grundlagen der Korrelationsanalyse und der Regressionsanalyse. 151 pp. ISBN 3-930037-18-1  
ISBN for all four volumes: 3-930037-14-9.

The four volumes of the “Introduction to Biometrics” were written on the basis of courses which were organized for the employees of federal agricultural research institutes in Germany. As the first edition issued in 2002 and 2003 met with great interest, the second edition was printed already in 2004 and will be available to the public.

Volume 1 has three parts: definition of biometrics, descriptive statistics for one trait and fundamentals of statistical deductions. In the first part, after a historical overview of biometrics, basic principles for planning surveys, sampling and for designing experiments are discussed. Several ways the traits can be scaled are differentiated (qualitative and quantitative traits, continuous and discrete traits). The second part includes the definition of parameters describing empirical distributions, the principles of forming classes and ways of the graphical representation of empirical data. In the third part, the terms ‘random event’, ‘probability’ and ‘random variable’ are introduced to continue with the most important probability distributions and distributions of test statistics.

Volume 2 is focused on parameter estimation and hypothesis testing. Chapter 1 describes the procedures for the estimation of one parameter (mean, variance, probability). The important term ‘unbiasedness’ is explained and the confidence interval is established. Chapter 2 is devoted to the important and frequently more or less neglected aspect of experimental design for the estimation of parameters. Chapter 3 and Chapter 4 present tests for testing hypotheses on parameters and tests on the normal distribution, respectively.

Volume 3 deals with multiple comparisons. The major part of the volume presents methods of the analysis of variance (ANOVA) (Chapter 1: one-way ANOVA, Chapter 2: multivariate ANOVA of balanced data – cross-classification and nested classification, Chapter 3: ANOVA with unbalanced data). Fixed, random and mixed models are described. Chapter 3 introduces the equations of the general linear model in matrix notation, but only an ANOVA model is used for their illustration. At this point or in the following volume, it would be useful to mention in a future edition that the general linear model may also include regression terms, which is important in many practical ap-

plications for example in animal and plant breeding. The last chapter discusses shortly, maybe too shortly, parameter-free methods.

Volume 4 starts in Chapter 1 with a general discussion about possible relations between two traits. In Chapter 2, undirected relations are analysed with the help of correlation analysis. The longest chapter is Chapter 3, which deals with regression analysis. Linear and non-linear, single and multiple regressions are presented. A great number of non-linear functions are analysed in detail.

In all four volumes, a list of symbols is given at the beginning and a lot of illustrative examples from agricultural sciences are used throughout. The examples are accompanied by listings of SAS programs and outputs. A special advantage of the series is that a fair amount of the text is devoted to experimental design. For examples in the field of experimental design, the program package CADEMO is used most frequently. A great number of exercises with solutions are given in all volumes. The series is well written with typing errors occurring only occasionally. The books can be recommended to German reading employees in all fields of agricultural research and administration.

This publication is available in the library of the Research Institute of Animal Production in Prague-Uhřetěves.

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