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Citation Classics

Snedecor G W & Cochran W G. Statistical methods applied to experiments in agriculture and biology. 5th ed. Ames, Iowa: Iowa State University Press, 1956.

This book is presently in its 6th edition, under the title Statistical Methods (Iowa State University Press, 1967). Dr. George W. Snedecor, who wrote the original work in 1937, died in February, 1974, at the age of 92. [The *SCI*® indicates that this book was cited 1,688 times in the period 1961-1975.]

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"Variation is a fundamental characteristic of living beings. Consequently, basic problems for the investigator in agriculture and biology are how to conduct investigations and how to analyze the collected data in such a way that these variations do not obscure what he or she is trying to learn and thus lead to wrong conclusions. It happens that the best methods we have been able to devise for analyzing data subject to variation depend on results in the rather abstract theory of probability. Many of the specific techniques currently found most useful were developed by one man–Sir Ronald Fisher-at the Rothamsted Experimental Station [England] in agriculture in the 1920's and early 1930's.

"Fisher's ideas were described by him in his book Statistical Methods for Research Workers, first edition 1925 [14th ed. Hafner, 1973]. But Fisher had no natural gift for teaching, and successive editions of his book have always been found heavy going.

"Professor Snedecor of Iowa State College (now University) was one of the first to realize the importance of Fisher's ideas and to begin presenting them in his lectures. In 1924, at the suggestion of Henry A. Wallace, later Secretary of Agriculture, Snedecor started a series of Saturday afternoon seminars for research workers in agriculture, in which Wallace participated.

"Snedecor's book Statistical Methods Applied to Experiments in Agriculture and Biology, first edition 1937, was itself pioneering. It was both an introductory text for students and a reference source for research workers. It was written clearly in an informal style with a minimum of mathematical symbolism or sophistication, making Fisher's ideas widely usable. Drawing on his long experience as a statistical consultant, Snedecor filled the book with illustrations from agricultural and biological research. For some years it was without a competitor, the third edition appearing in 1940 and the fourth in 1946.

"In time, other good introductory books with similar aims appeared on the market. But simultaneously the importance of sound statistical methods began to be appreciated in engineering, in the social sciences, in business, and in medicine and public health. Since statistical methods are to a considerable extent transferable from one field to another, Snedecor's Statistical Methods was extensively quoted as a reference in these fields also. This may help to explain its good performance in the citation race.

"I first became involved in 1955, when George Snedecor asked me to write a final chapter on the planning and analysis of sample surveys for the fifth edition, which appeared in 1956. Dr. Snedecor was then 75. Soon afterwards he asked me to prepare a sixth edition when this became due. It appeared in 1967. In this edition the phrase 'applied to experiments in agriculture and biology' was dropped from the title. This was for two reasons. Examples from other fields had been brought in, and a number of the newer techniques are not directed primarily at data gathered in experiments.

"Incidentally, I wonder if the statistics profession realizes the debt that it owes to the agronomists. Beginning before 1800, the astronomers were, I suppose, the first to apply probability ideas to the handling of their variation. But the agronomists, early in this century, were the first to make intensive studies of the nature of the variation in plant and tree crop yields with a view to finding the best methods for conducting and analyzing experiments. Perhaps more important to us, they were the first to realize that statisticians are useful and must eat. Many of the outstanding professional statisticians in the world today found either their first job, or an early job before they were well known, in agriculture."