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THE DIFFUSION OF TRACE ELEMENT TECHNOLOGY: AN ECONOMIC ANALYSIS

A thesis submitted in partial fulfilment of the requirements for the Degree of Master of Agricultural Science.

by

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SUMMARY

This study will endeavour to quantify the innovative and imitative aspects of copper-zinc adoption for chosen regions of the State of South Australia. This will be followed by attempts to 'explain' any observed inter-regional differences in the estimated adoption parameters.

Chapter 2 will provide a brief overview of the scientific investigations which uncovered the relatively dramatic impact of copper-zinc fertilizers on broad-acre crop and pasture production. This will be followed in Chapter 3 by a detailed consideration of the techniques used by previous studies to quantify observed adoption patterns. Particular emphasis will be given to the (symmetry) assumptions of the commonly employed logistic function as it relates to studies of the diffusion of new technologies.

The techniques used to aggregate the 24,000 observations, which constitute the raw data base of this study, will be detailed in Chapter 4. The subsequent Chapter will attempt to assess empirically the validity of the symmetry assumption with respect to the observed patterns of adoption. On the basis of these findings, Chapter 6 will outline the procedures used to quantify the innovative and imitative aspects of trace element adoption. The parameters so derived will be tabulated.

Chapter 7 will notionally consist of three parts. Part A will detail, at both the conceptual and empirical levels, those factors which on *a priori* reasoning may account for inter-regional differences in the parameters of adoption. Part B will present and discuss the multiple regression results which were obtained when attempting to 'explain' innovative aspects of copper-zinc adoption using the factors mentioned above. Multiple regression techniques will also be used to determine the 'explanatory' significance of these same factors in relation to the imitative aspects of copper-zinc adoption. This will account for Part C of Chapter 7.

The conclusions of this study will then be detailed in Chapter 8.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made in the text.

Signed__

Philip G. Pardey.

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