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## REQUIREMENTS FOR CONTRIBUTIONS

Articles in the field of agricultural economics, suitable for publication in the journal, will be welcomed.

Articles should have a maximum length of 10 folio pages (including tables, graphs, etc.) typed in double spacing. Contributions, in the language preferred by the writer, should be submitted in triplicate to the Editor, c/o Department of Agricultural Economics and Marketing, Pretoria, and should reach him at least one month prior to date of publication.

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# Contents

	<u>Page</u>
<b>I. RESEARCH IN AGRICULTURAL ECONOMICS: PAPERS READ AT THE ELEVENTH ANNUAL CONFERENCE OF THE AGRICULTURAL ECONOMIC SOCIETY OF SOUTH AFRICA IN PRETORIA, 25 TO 27 OCTOBER 1972</b>	
1. Opening address .....	1
- The Honourable Hendrik Schoeman, Minister of Agriculture	
2. Modern requirements for agricultural economic research .....	4
- Prof. J. A. Groenewald	
3. An evaluation of agricultural economic research .....	14
- Mr H. S. Hattingh	
4. Data problems in agricultural economic research .....	20
- Dr W. L. Nieuwoudt	
5. Institutional aspects associated with agricultural economic research .....	27
- Prof. H. I. Behrmann	
6. The agricultural economist and interdisciplinary research .....	33
- Prof. S. S. Brand	
7. Models in agricultural economic research .....	38
- Mr P. H. Spies	
8. A few personal thoughts .....	44
- Prof. F. R. Tomlinson	
<u>Condensed papers of introducers of group discussions</u>	
Farm enterprise research	
9. Engineering-economic problems .....	49
- Mr P. de V. Louw	
10. Biological-economic problems .....	51
- Mr J. B. Martin	
11. Application of research results: diffusion, adoption and perception .....	53
- Mr S. C. Jacobs	
<u>Marketing research</u>	
12. The consumer and his needs .....	55
- Mr B. K. van der Merwe	
13. Marketing policy instruments in the light of small markets and low purchasing-power of non-Whites .....	57
- Mr F. J. van Eeden	
14. Priorities in agricultural marketing research .....	59
- Mr I. S. Geldenhuys	
15. List of papers of introducers of group discussions (not available for publication) .....	61
<b>II. STATISTICS .....</b>	<b>62</b>

# An evaluation of agricultural economic research

by

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Division of Agricultural Production Economics

## I. INTRODUCTION

The approach to this paper is twofold. Firstly, agricultural economic research is evaluated on the basis of its achievements as well as its shortcomings. Secondly, the future requirements of agricultural economic research are sketched.

Several speciality fields comprise agricultural economic research as overall subject. In this paper, the following are distinguished:

- Farm business management research
- Agricultural marketing research
- Macro agricultural economic research

## II. AN EVALUATION OF AGRICULTURAL ECONOMIC RESEARCH

### A. AN INVENTORY SURVEY

A list of theses, dissertations and bulletins relating to agricultural economic research has been compiled. An attempt has also been made to include all theses and dissertations relating to South African agricultural economics that have been submitted to overseas universities.<sup>1)</sup>

Theses, dissertations and bulletins are, of course, not the only means by which research results can be published. Research is often undertaken in order to supply information for policy making purposes. Such information is usually made available only to the persons and organisations concerned. Many of the results of research in the field of farm business management is made available to the collaborating farmers only. Research results are also often only made available by means of papers, lectures or articles. Agricultural Economic research is also undertaken by several private organisations and control boards, particularly in the field of marketing. The extent of this research is not known, as the results are usually never published.

### B. FARM BUSINESS MANAGEMENT RESEARCH

The aim of farm business management research is to promote the effective use of agri-

cultural resources by supplying to farmers information on agricultural production economics.

#### 1. Farm organization studies

Farm organization studies deal with aspects such as the size of farms, land division and usage, investment of capital, financial results and the establishment of physical and financial standards for farm planning purposes.

While much research has been undertaken in this field, it has mostly been of a descriptive nature. In only a few cases the study went further than the identification of the factors influencing the profitability of farming enterprises and the establishment of standards for the purpose of comparing between farms.

#### 2. Farm enterprise studies

These studies are concerned with the economics of individual farm enterprises. Up until the present income and cost budgets of farm enterprises, have mainly taken into account certain production practices. Physical inputs and outputs, as well as cultivation practices are also often included in these budgets. The aim of research of this nature, is to obtain information on the profitability of specific branches of farming for farm-enterprise planning purposes. In order to better comply with this aim, such budgets should also indicate the quantities of physical input and output as well as the cultivation practices.

#### 3. Farming practice studies

Only a few studies of this kind have been undertaken to date. These studies are distinguished from farm enterprise studies in as far as they only deal with a particular practice or group of related practices. These studies are important, as valuable information for decision making and planning purposes can be obtained in this way.

#### 4. Management research

Almost no research regarding management as a production factor has been undertaken to date.

#### 5. Research on methodology

(a) Collecting information - The method of questioning with the aid of predetermined questionnaires, has always been an important way for agricultural production economists to obtain data. The reason for this is that farmers on the whole are still lax in keeping adequate records for research purposes.

1) Copies of this list are obtainable from the Secretary, Agricultural Economic Society of S.A., Department of Economics, University of South Africa, P.O. Box 392, Pretoria. The writer wishes to thank Mr A. de Villiers of the Division of Agricultural Production Economics who compiled this inventory

In the past, therefore, much attention had been given to the compilation of record books which would be acceptable to both farmer and research worker, and several such record books appeared over the years.

In the era in which farm business management research still falls, agricultural production economists should devote a considerable amount of time to the propagation of the importance of recordkeeping and the compilation of suitable record books.

Methods of collecting information on farm business management via the post, have also progressed in the past few years in the form of the postal record system.

In the case of farm enterprise studies, where the focus mainly falls on income and cost budgets including input/output ratios and cultivation practices, the survey method and even postal records are less successful. In these studies the so-called group conference method is used. This method of data collecting comprises the questioning of a group of 5 to 10 successful producers of a particular product, applying more or less similar production techniques.

This method has been tested a few times and without doubt holds promise for the establishment of above-average standards for planning purposes.

In the case of farm enterprise as well as farming practice studies, very little contact has thus far existed with technical research workers. This kind of research particularly lends itself to collaboration with technical research workers. Technical research results are a source of information that should be used to a far greater extent.

In order to use more realistic prices of inputs and outputs in these types of budget, closer contact with agricultural marketing research workers is also necessary.

(b) Processing farm business management data - Much attention has been given to methodology on processing of farm business management data by means of a computer. A farm business management analysis program which has been developed, is already being used on a relatively large scale. An income tax program compiled according to the tax sheet has also been developed. Several programs have also been compiled to edit the information during the various stages of data processing.

(c) Comparative analysis between farms - Methods whereby defects in existing farm organizations can be detected, using comparable standards, have also received considerable attention. The method of comparative analysis between farms, as it is presently used, is effective and easy to understand. This method, however, also has definite shortcomings that cannot be ignored. Criticism aimed at this technique usually includes the following:

(i) The standards used are not always applicable to individual farms.

(ii) Comparative analyses between farms may be suitable for the identification of mistakes. The standards as such, however, cannot indicate how to rectify these mistakes.

(iii) This technique provides no basis for optimum farm planning.

(iv) Comparative analysis tends to over-emphasize the past, while future expectations as well as new production techniques are ignored.

(v) The averages serving as guides in decision-making and the way in which they are used are not always reconcilable with the theory of agricultural production economics.

(d) Budgeting techniques - A considerable degree of success has already been achieved with the partial budgeting technique in cases where it was used with comparative analysis. The full budgeting technique has also received attention in the past. Little attention, however, has been paid to development budgets.

(e) Production-function analyses - Some attention has also been paid to research in the field of production-functions. These studies emphasise the importance of knowing about the productivity of resources at the marginal application level.

(f) Gross margin analysis - At present this technique is widely used. The advantages of the technique is that it is easily understood and that it is founded on the theory of economics.

Attention has also been paid to an arithmetical planning technique, the so-called activity planning technique, that is adapted to gross margin analysis. This planning technique is particularly suitable in cases where only a few farming activities and restrictions have to be considered.

Gross margin analyses are also completely reconcilable with linear programming. In such cases the aim becomes the maximisation of income over and above directly allocatable variable costs.

(g) Linear programming - As a result of the disadvantages of the other planning techniques, the acceptance of the linear programming technique by agricultural production economists is a natural development. The sophistication of this mathematical technique and the possibilities of providing the best plan, has given linear programming a certain amount of status. Considerable research relating to linear programming has been undertaken, particularly in the academic field. At this stage the technique is also more of academic importance and the prospect of it being used on a large scale for the planning of individual farms is at present very small.

Linear programming can, however, be effectively used for drawing up optimum regional plans.

These regional plans can act as aims or theoretical standards to be achieved. It will, however, be necessary to determine the extent of deviation between the present situation and the theoretical standard - the so-called 'problematical gap.'

Following this, attention must also be paid to the identification of the factors which -

- (a) prevent the ideal situation and the present situation from being equal (the element of failure); and
- (b) tend to equalise the present and the ideal situation (the element of success).

This approach is to the point, viz, how to move from the present situation to the ideal situation. It is self-evident, however, that not only agricultural production economists, but also technical research workers, sociologists, and agricultural marketing research workers, should be involved in research of this kind.

### C. AGRICULTURAL MARKETING RESEARCH<sup>2)</sup>

Until recently, agriculture in South Africa was mainly production orientated. Markets for the majority of products were readily available. During this stage, therefore, no pressure for extensive research existed. Although only a few research workers undertook research in this field in the past, they were able to pay attention to the more urgent difficulties. Satisfactory results were obtained, particularly in view of the limited and often obsolete statistical data that had to be used.

While the whole marketing field has already been considered to a certain extent, research had so far mainly been aimed at a few products and then only at a few aspects of the marketing channels. Research was seldom undertaken on a continuous basis and was generally of a fragmentary nature.

As agricultural marketing research was usually undertaken on an ad hoc basis, and several organizations were concerned, with little or no co-ordination, the question arises whether its object was attained - even in respect of the specific products for which it had been undertaken.

Due to the considerable increase in agricultural production in the past decade, agriculture is becoming more and more market orientated. More extensive and intensive marketing research is therefore of the utmost importance for the effective development of agriculture.

Up to this stage, the field of agricultural marketing research still lies open and, particularly

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2) The writer wishes to thank Mr I. Geldenhuys, Chief of Division of Agricultural Marketing Research, for the report on this subject. Due to a lack of space only a résumé is dealt with here

in view of the uncertain international economic situation, it should urgently be considered. In this respect the potential of the interior market, particularly the Bantu market, must be properly exploited. Marketing in neighbouring areas also deserves more attention.

In a marketing orientated economy, purposeful and continuous research will have to be undertaken on all the phases in the marketing process and with regard to the marketing of all kinds of agricultural products, locally as well as in foreign countries. The following directions of research should receive particular attention:

#### 1. Structural studies

These studies deal with the collecting of data relating to production and outlets, as well as quantities produced and marketed. Information of this kind, on a continuous basis, is necessary for all similar products. Attention should not only be paid to products in their fresh or raw state, but also in their processed state.

Research of this nature supplies only factual information on different agricultural products and as such is not orientated toward problem solving. It must be attempted to conduct structural studies in such a way as to pinpoint difficulties. It is therefore, also imperative that these studies be followed up by research aimed at finding answers for the difficulties that have been exposed. It is clear, however, that for the latter kind of research to be effectively conducted, a greater extent of collaboration will have to be implemented between agricultural marketing research workers and farm business management research workers.

#### 2. Consumer research

In a marketing orientated economy, the consumer is of primary importance. The aim of research of this nature is to determine where, when and how the consumer requires a particular product. It should also be able to give an indication of how, and to what extent consumers can be influenced to buy more of a particular product.

#### 3. Demand and price analysis studies

The aim of research in this field is to determine the demand for a certain product in the past, by means of approved statistical and mathematical techniques.

With the aid of results of these studies, advance estimates of the demand for particular products, as well as expected future prices that can be realised, can be made. Advance estimates are difficult to make, but are of the utmost importance.

In the planning of their farming, farmers must continually estimate in advance. This is of equal importance for the long-term planning of agricultural industries. For the above-mentioned planning purposes, advance estimates of 5 years are the minimum requirement, but a 10 to 15 years prediction would be preferable.

It is hoped that we will eventually have enough information and that methods will be so sophisticated that not only long-term advance estimates of product prices be possible, but also of changes in the number of farms, division of farms in size groups, area under different crops, livestock numbers and composition, as well as the use of inputs such as fertiliser, fuel, labour, capital and so forth.

In order to succeed, not only the past will have to be taken into account. Present and new technologies and their expected influence on agricultural production will also have to be considered. Clearly research of this nature can only be successfully conducted if it is tackled on a multi-disciplinary level.

#### 4. Efficiency in the marketing channel

The aim of research of this nature is to hand over agricultural products to the consumer in the best possible way. It comprises research on, functions such as, grading, packaging, transport, refrigeration and dissemination.

### D. MACRO AGRICULTURAL ECONOMIC RESEARCH<sup>3)</sup>

#### 1. Production cost and situation determining studies

Production cost studies, as well as situation determining studies, are often grouped with farm organization studies under the speciality heading of farm business management research. The primary aim of production cost and situation determining studies, however, is to obtain information for the determination of prices or other agricultural matters. As a rule, studies of this nature only express a situation as it was under certain circumstances. Such studies are often undertaken because of an abnormal agricultural situation in a certain field or branch of farming and the information cannot, therefore, be used for farm planning purposes.

A considerable percentage of the total available time of agricultural production economic research workers is spent on production cost and situation determining studies for the purposes of formulating agricultural policy. Production cost studies, i.e. where fixed costs are also divided between farm enterprises, is very time consuming. It is an open question whether the value of production cost figures justifies the time and costs spent to obtain them. We have a suspicion that the time spent on the allocating of fixed costs between farm enterprises could be better spent in some other way.

#### 2. Method of obtaining and controlling inputs

A study of the factors influencing land prices has already been undertaken. If we take into account

3) Macro agricultural economic research is sometimes referred to as agricultural policy research. This could be because the primary aim of such studies is to obtain information with a view to policy-making

that high land prices is one of the biggest problems in agriculture, research in this field should receive much more attention. For this same reason, research on alternate forms of land use rights, is important. Relatively little research has to date been undertaken in this field.

Fields of research that should receive attention include -

- (a) the role that land use agreements can play in entering farming or enlarging farm units;
- (b) the influence of alternate agreements of land use rights on the conservation and optimum utilisation of the soil; and
- (c) the role of credit in the different forms of agreements on land use rights.

Research on agricultural finance has also received some attention. To date, however, research in this field has been mainly of a descriptive nature. Little research has been undertaken in order to solve the finance problems in agriculture.

#### 3. National accounts, economic tendencies and crop estimates<sup>4)</sup>

The collection of statistics in order to maintain the above-mentioned services is a phenomenal task, the extent of which continually increases. Methods research and the use of a computer have done much in meeting an ever-increasing need for agricultural statistics.

Although the information to date has been adequate for the more urgent needs of policy formulation, the need for more detailed information is increasing. It also seems imperative that the services rendered must be extended to other fields.

It is self-evident that methods research in these fields remain important in order that timely and reliable information can be made available.

#### 4. Socio-economic research<sup>5)</sup>

Agricultural economic policy in South Africa has, up until now, been centered around the Marketing Act to a large extent. As a rule the present method of price determination aggravates rural problems. It definitely does not serve as a solution. Basically, the farming problem deals with structural changes in rural areas as a result of slow agricultural economic growth. While in absolute

4) Personal communications, Mr H. Steynberg, Assistant Chief Division of Agricultural Marketing Research

5) The writer wishes to thank Prof. D.J.G. Smith, Director of the Institute for Social and Economic Research, U.O.F.S., and Prof. H.A. Kotzé, U.O.F.S., for their valuable contributions in this connection

terms the agricultural sector has indeed grown to a considerable extent, it is slow in comparison with the other sectors of the economy.

The considerable growth of the agricultural sector in absolute terms, was made possible by the application of biological and mechanical innovations. This gives rise to increased productivity and the replacement of labour by capital inputs. As farming becomes more commercialised it sets higher requirements for management and more careful economic planning becomes a prerequisite. It also brings about an enlargement of farm units. This brings us up against problems, programmes and possibilities of consolidation.

On the other hand these changes give rise to the dismissal of labour and we are faced with problems such as alternate work opportunities, old-age pensions and retraining programmes.

Agricultural growth, resulting from the application of biological and mechanical innovations is, however, not the same everywhere. In the areas of high potential a relatively fast growth takes place. In the extensive areas the growth rate is extremely slow. Policy measures taken regarding these extremes, will inevitably have to differ.

Research of this kind requires a multidimensional approach that must be tackled on a multidisciplinary basis. If these adjustments are not made in time, impoverishment and retrogression of the economy as well as human material, will inevitably result.

A considerable amount of basic as well as applied multidisciplinary research has already been undertaken in the field of rural development.

It is heartening to know that the results of this kind of research have already been accepted to a considerable extent in practice. The Provincial Administration of the Orange Free State already takes these research results into account when providing infra-structure services. The results obtained through research have, for example, been taken into account in providing new school facilities, additions to schools, as well as hospital services. They are also, at present, compiling a theoretical model for the provision of road network for the Orange Free State, where the changes in structure have definitely been taken into account. A policy of town compacting has also been agreed on in principle and funds for this purpose have been included in the budget.

The importance of research in this field is shown clearly in the Third Report of the Commission of Inquiry into Agriculture and it has already led to the establishment of the Committee of Investigation into Rural Reform.

### III. FUTURE REQUIREMENTS

#### A. PRIORITIES

From all sides the importance of research according to priorities is emphasized. It is an ab-

solute prerequisite, if the maximum benefit is to be obtained from a given, and under the circumstances, an ever-limited research budget. Hobby research cannot be allowed. If the head of a research organization must decide on priorities for himself, the danger of personal interests influencing objectivity may occur. Objective priority determination can only be undertaken by an independent organization, consisting of different interest groups.

In the case of agricultural economic research, priority determination must, however, be handled with great care. Research according to present priorities is, strictly speaking, only possible under static conditions. Agricultural economic conditions are definitely not static. A change in agricultural conditions must inevitably bring about a continuous revision of research priorities.

#### B. PROBLEM RESEARCH

In the past, agricultural economic research often amounted to a mere description of a situation during a certain period. Such studies are often motivated on the grounds that no recent data on the particular production or marketing matter exist.

The determination of priorities will, it is hoped, be instrumental in limiting these studies to the minimum. Of equal importance for purposeful research is the fact, however, that the research worker must ascertain the extent of the real problem that must be solved. If the problem that has to be solved cannot be precisely formulated, purposeful research is impossible. Only when the research worker clearly understands the core of the problem, will he be able to formulate a hypothesis or theoretical solution. The hypothesis in turn dictates the subject of the empirical research procedure. Without a hypothesis the chances are small that the correct research procedure will be followed.

In the future, no research project should be approved if -

- (a) the problem is not formulated clearly and scientifically;
- (b) an acceptable hypothesis as solution to the problem is not formulated; and
- (c) the pattern of the empirical research procedure is not set out systematically.

#### C. MULTIDISCIPLINARY RESEARCH

A greater extent of co-operation will in future have to exist between agricultural economists working in different specialist fields. Agricultural economics research workers will soon have to realise that farm business management research, marketing research and macro agricultural economic research cannot be separated from one another.

As problem research is taken into account more and more, and situation determination and



methodology studies less and less, it will have to be realized that even agricultural economics as a subject is often too narrowly defined.

If, however, agricultural economists find it difficult to co-operate, one shudders to think of the difficulties in the way of successful multidisciplinary research requiring the co-operation of engineers, agriculturists, animal scientists, sociologists, pure economists, lawyers and so forth. It is a challenge that we shall have to accept and the suitable climate for such co-operation will have to be created.

#### IV. CONCLUSION

In view of the limited funds that to date have been available for agricultural economic research, we can look back with satisfaction on the quality and quantity of the research undertaken.

It is obvious that, in the case of a young and dynamic science such as agricultural economics, an extensive amount of time had to be spent on

methods research and that methods research will always have to receive attention in the future.

In future, however, methods will have to be given less attention and problems more. Research results will have to comprise more than mere sophisticated mathematical techniques and literary dexterity. In future less research should be done for the sake of research workers. We shall have to ascertain for ourselves in clear outlines our clients and their problems.

This means -

- (a) the establishment of a body to determine priorities on a continuous basis;
- (b) that research will have to be undertaken strictly according to priorities;
- (c) the establishment of stricter guidelines for the drafting and approval of projects; and
- (d) the establishment of research teams of a satisfactory size, constituted from different subject disciplines according to the research problem to be solved.