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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

# Management Accounting in Agriculture

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## INTRODUCTION

Modern business, be it industry, commerce or agriculture, is becoming increasingly dependent upon the expert and specialised assistance of the scientific and learned professions. The modern age has brought with it a more complex society; this, in turn, has rather complicated the age-old problem of business - the problem of making a profit.

The constitution of the profit problem itself is very simple to enunciate: over a period costs must be lower than receipts to yield a profit. This being the case, it is not unnatural that accountancy was one of the first professions to come to the aid of management. This has been evident in agriculture as well as in commerce and industry. Much of the earlier and present work in farm management has centered around calculations of costs and of profits; the first principles of farm management were in fact, derived from cost investigations [1].

For many years, the chief services rendered by accountancy in agriculture as well as commerce and industry, were concerned with the purely (annual) financial aspects of the undertaking; i.e. a summary of money coming in and money going out. Little attention was given to the actual determination of points of inefficiency and to cost control. Over time, however, a new form of accountancy, viz. cost and management accounting evolved, the purpose being to investigate all inputs continuously and therefore exert control over all expenditure and to furnish management with a concise report on these matters.

Management accountancy was virtually unknown until some fifty-five years ago, at which time it became a feature only in certain specialised industries, particularly engineering [2]. Its application to a wider variety of industries developed during the inter-war years in the United States of America and during the post-war period in the United Kingdom. However, its use has become so widely recognised as a management aid that it has now reached a virtually indispensable position in a large and increasing part of industry and business throughout the world.

Agriculture has, for reasons to be discussed later, been one of the few

1) c.f. J.R. CURRIE. A review of Fifty Years' Farm Management Research. (Jour. Agr. Econ., Vol. 11, 1956, Pp. 353-361).
H.I. BEHRMANN. The Beginnings of Farm-economic Research in South Africa. (Agrekon, Vol. 3, No. 4, October 1964, Pp. 17-25).
S.S. BRAND AND J.B. DE SWARDT. The Use of Interfarm Comparisons in Improving Farm Management Efficiency in South Africa. (S. Afr. Jour. Econ. Vol. 32, 1964, Pp. 95-112)
HENRY C. TAYLOR AND ANNE DEWEES TAYLOR. The Story of Agricultural Economics in the United States, 1840-1932 (Iowa State College Press, 1952).

2) F.J. WRIGHT. The Evolution of Modern Industrial Organisation 2nd Edition (MacDonald and Evans London 1957) Pp.168.

areas in which the application and development of management accountancy has been relatively slow. Nevertheless, the world-wide declining terms of trade of agricultural products and the resulting "price cost squeeze" in which agriculture finds itself, together with the increased complexity of modern farm production techniques has stimulated an interest in the possibilities of applying management accounting techniques in agriculture.

In this article an account is given of some of the methods and techniques employed in cost and management accounting. An evaluation will also be given of the extent to which these techniques may be applied to agriculture.

## WHAT IS MANAGEMENT ACCOUNTING?

Management accounting is essentially an aid which may be used in conducting the short-run affairs of a business efficiently. Its main purpose is not to evolve the long-run production plans or to be the decision-making factor for the purchase of expensive equipment or the scale of a major enterprise, but much rather to assist management in carrying out its long-term (or annual) programme. Other analytical aids should be used for these long-run decisions - such as linear programming, integer programming, programme planning, marginal analysis, and partial budgeting. Management accounting can in no way be regarded as a substitute for these analytical aids - its function is mainly to ensure that the production plans evolved by use of these techniques are carried out as efficiently as is possible.

It is often found in business - agriculture not being any exception to this rule - that after the long-run or annual decisions have been made, certain bottlenecks and maladjustments arise in the organization, thereby prohibiting the efficient attainment of the goals aimed at in the long-run programme. It also happens quite often that gross inefficiencies occur in minor points not covered in the overall programme. Such bottlenecks and inefficiencies can often have profoundly depressing effects on the profitability of a business. It is such inefficiencies which management accounting endeavours to reveal and minimize or eliminate.

Management accounting is basically the development of recordkeeping and administrative procedures which will provide management with useful information which will help to pin-point and eliminate inefficiencies or over-expenditure as soon as possible. The basic objective is cost control and thereby to increase efficiency.

In order to provide data which can be used for cost control it is necessary first of all to classify and analyse costs 3). This is essential, because, while the total cost of any enterprise or department in a farm or business may be obtainable from financial accounts and thus show whether that area of expenditure was profitable or not, it is only by classifying the components of total cost that compensating factors may be revealed.

For the purposes of management accounting, costs may be classified as follows:-

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3) H.J. WELDON. Cost Accounting and Costing Methods. (MacDonald & Evans, London, 1960) P. 7.

1. Direct labour
2. Direct materials
3. Direct expenses
4. Overheads
   (a) Production
      (i) Departmental (or Enterprise)
      (ii) General
      (iii) Services
   (b) Administration
   (c) Selling and distribution

Prime costs

Production costs

Total cost of sales

The above items are defined and explained below:-

1. Direct labour

This concerns labour for which wages can be charged direct to the cost of producing a particular product. It will be shown later that in this context a product is not necessarily the final product in terms of a saleable article. In the short-run concept, a ploughed field or a sprayed fruit-tree may be regarded as the products of ploughing or of spraying.

2. Direct materials

This applies to all materials the cost of which can be charged direct to a particular product. (Once again, not necessarily the final, saleable product). It includes materials produced by certain departments or enterprises in a business and used in other departments or enterprises; for example, manure from a pig enterprise used to fertilize tomatoes would be a direct materials cost to tomatoes (and of course direct income to pigs).

3. Direct expenses

Direct expenses include any expenditure other than direct material or labour incurred specifically for a particular product. Examples include the maintenance costs of special equipment (such as a milking machine), the cost of special layouts or the hire of single purpose equipment such as a combine harvester.

4. Overhead expenses

"Overheads" may be defined as the cost of indirect and any other expenses including services, which cannot conveniently be charged direct to a specific product or department. Overheads may be either fixed or variable in the classical economic concept.

Overheads may be sub-divided into three main groups:-

(i) Production Overheads

This category covers all indirect expenditure incurred by the undertaking from the commencement of production right through to completion ready for despatch. Production overheads will include items such as rent, rates, insurance, indirect labour (e.g. supervision), depreciation, etc.

(ii) Administration Expenses

This consists of all expenses incurred in the direction, control and administration of an undertaking. It includes accounting and secretarial expenses, bank charges, legal expenses and so on.

(iii) Selling and Distribution Overheads

This includes advertising, agents' fees, railage or cartage, and all other expenditure incurred from the time the product leaves the farm until it has been sold.

In addition to the above classification of expenditure, overheads may further be classified as fixed, variable and semi-variable. This classification, if and when it is done, is done to provide an indication of the effects of production volume on expenses and may be regarded as more of a planning exercise than direct management accounting. Most of the administration expenses, for example, would normally be classed as fixed overheads, whereas a considerable proportion of production overheads and selling and distribution overheads may often be classified as variable or semi-variable. It should be emphasised, however, that variable and fixed costs in this sense should not be confused with controllable and uncontrollable costs. During the planning process it may sometimes be found that variable costs are harder to cut than fixed costs [4].

All costs can be classified into the categories mentioned above, although of course the decision on whether certain expenses should in fact be classified as a prime cost or an overhead, or (in the case of the latter), as fixed, variable or semi-variable, may require a good deal of thought on the part of the management accountant.

A further requirement for effective cost control is the sub-division of the business into departments or enterprises so that the financial position of the various sections of the business can be ascertained. It may be advisable to further sub-divide a particular department into two or more "cost centres" where the nature of the production process in that particular department or enterprise is such that there are two or more distinct cost sources. There appears to be no rule governing the division into cost centres, the logic of the process being the deciding factor. This division should be done only if this would provide useful information for cost control.

Two further developments are necessary if the greatest benefit is to be derived from management accountancy. These are the development of budgetary control and the establishment of standard costs. These techniques, while not necessarily inter-dependent [5], give the greatest value when used in conjunction with one another.

Budgetary control is not new in agriculture; neither is the use of standards. Their use is primarily to formulate a production policy for the business and then furnish some yardstick against which the actual performance in each department may be measures.

In actual fact, the preparation of the Budget implies that some form of standards exists even if these are merely "rule of thumb" standards. The standards referred to in the industrial Standard Costing context, however, are standards which have been arrived at after thorough investigation and represent the actual inputs and outputs in physical terms which can be attained under practical conditions where reasonably efficient circumstances prevail. A budget based on such standards will provide a comparison between the actual performance within a department (enterprise) or cost centre and the performance which should be attained when this department or cost centre performs with a certain degree of efficiency. Thus information on the specific locality of inefficiency can be obtained and reported.

The chief advantages of budgetary control and standard costing may be summarised as follows:- [6]

1. Actual performance is readily comparable with predetermined standards, showing both favourable or unfavourable variances from the standard.
2. These variances can be analysed in detail, enabling management to inves-

4) JOEL DEAN. Managerial Economics. (Prentice Hall Inc., New York, 1951) P.257.

5) H.J. WELDON. Op. Cit. P. 303

6) Ibid. P. 325

tigate the cause. Any inefficiencies in the use of labour, materials or machines or both will be discovered.

3. The principle of "management by exception" can be applied, in that the manager can obtain the largest marginal benefit to his efforts by devoting his attention to the centres where it is needed most - where inefficiencies or bottlenecks occur. If variances are favourable there is no need to worry about them; only the unfavourable variances warrant attention.

4. Gains or losses due to market fluctuations in the price of raw materials are segregated from variances due to efficiencies or inefficiencies in production.

## AN INDUSTRIAL EXAMPLE OF MANAGEMENT ACCOUNTING

Because it is in non-agricultural industry that management accounting has reached a relatively high standard of refinement it is proposed to describe a hypothetical management accounting system as it might operate in a factory manufacturing farming requisites. While it must be admitted that industry has considerable advantages, vis-á-vis agriculture, in applying a sophisticated management accounting system, an example is discussed here because it will provide some indication of the standard of control to which agriculture might aspire.

An undertaking which manufactures a variety of farm requisites may be divided into a number of different departments; one of these may be a wheelbarrow department. The construction of wheelbarrows involves the processing of steel sheets which form the carrier portion of the wheelbarrow and which is subsequently bolted on to legs, handles and the front wheel, the completed assembly being painted before returning to the stores for despatch.

There are thus two stages in the manufacture of wheelbarrows and the department may therefore be sub-divided into two cost centres:

1. The Pressing Centre, and
2. The Assembly and Painting Centre.

While the above division into cost centres was made on the basis of production stages, the division may also have been made on the grounds that the pressing centre was a machine intensive centre while the assembly and painting was a labour intensive operation.

From measurements taken it is simple to ascertain exactly how many carriers could be pressed from a sheet of steel of a certain size. Thus, if the pressing centre requisitions say 50 sheets of steel from the stores it would be expected to turn out a pre-determined number of completed carriers. Any off-cuts and waste material could also be calculated so that a complete check is maintained on the material usage in this centre.

Work studies would make it possible to determine a standard time for the production of each carrier. From clock cards it would then be possible to calculate the number of hours worked in this cost centre and the number of completed carriers which should have been produced over a period.

A similar analysis could be made in the Assembly and Painting Centre: the components required to complete the assembly of the barrow could be calculated relatively easily as well as the time required to assemble and paint the wheelbarrow.

The recording of the actual expenditure and usage of material and time is relatively simple. Details on material used may be obtained from requisition slips, while the number of finished articles returned by each cost centre to the stores can be found on Stores' Receipts.

At the end of each week (we are assuming that control is exercised weekly in this factory, although many fac-

tories would exercise daily or even hourly control) the clock cards for each centre are analysed so as to determine the number of hours worked. In addition, as there would obviously be half finished work both at the beginning and the end of the week, a "work-in-progress" count would have to be made, the time and material spent on half finished work being calculated. In this way the actual work done during a week's operation can be calculated in terms of time and material. The next step is to compare the expected production for the week, calculated from standards, and to compare it with the actual production in terms of labour, material and expenses, both in physical and monetary terms.

The cost centre supervisors' reports showing details of the week's work are then prepared and from this the foreman of each department compiles a report showing the variances as indicated in table 1.

TABLE 1 - Head foreman's report

| Items | Variances: Wheelbarrow Department | | |
|---|---|---|---|
| | Pressing centre | Assembly and Painting centre | Total |
| | R | R | R |
| Labour | -10 | +5 | -5 |
| Material | + 6 | -2 | +4 |
| Expenses | 0 | -8 | -8 |
| Total | - 4 | -5 | -9 |
| Efficiency Ratio | 98 | 96 | 97 |
| Activity Ratio | 102 | 100 | 101 |

The variances in table 1 merely indicate whether the use of inputs to produce the output realised compared favourably or unfavourably with the standard. If, for example, more labour was used than the standard would indicate, this will constitute a negative variance of the size of the expenses involved in using the extra labour.

Thereafter, the factory manager's report is compiled, as shown in table 2.

In this way, the factory manager is supplied with a guide which immediately pinpoints inefficiencies which may - and should - be investigated and rectified promptly.

The reports shown include two items which require explanation - the efficiency and activity ratios. It is possible that these may provide a useful application in agriculture.

The Efficiency Ratio is defined as the standard hours needed for the work produced, expressed as a percentage of the actual hours spent in producing that work. It can be expressed as:

$$\frac{\text{Standard hours needed for realised production}}{\text{Actual hours worked}} \times 100$$

For example, if the standard indicated that one wheelbarrow can be produced in $1\frac{1}{2}$ hours, and production during the week was 100 wheelbarrows produced during actual work of 125 hours then the efficiency ratio can be calculated as follows:

Standard time of producing 100 articles at $1\frac{1}{2}$ hours each = 150 hours

$$\therefore \text{Efficiency Ratio} = \frac{150}{125} \times 100 = 120$$

The Activity Ratio is the number of standard hours needed for the work produced, expressed as a percentage of the standard hours for budgeted production.

The formula is:

$$\frac{\text{Standard hours needed for realised production}}{\text{Standard hours needed for budgeted production}} \times 100$$

TABLE 2 - Factory manager's report

| Items | Variances | | | | |
|---|---|---|---|---|---|
| | Wheel-barrow Dept. | Engineering Dept. | Plough Dept. | Service Dept. | Total |
| | R | R | R | R | R |
| Labour | -5 | -6 | +1 | +2 | -8 |
| Materials | +4 | +4 | +3 | -8 | +3 |
| Expenses | -8 | +2 | +1 | 0 | -5 |
| Total | -9 | 0 | +5 | -6 | -10 |
| Efficiency Ratio | 97 | 100 | 102 | 91 | 96 |
| Activity Ratio | 101 | 97 | 101 | 102 | 100 |

Continuing the above example, assume that the budgeted, i.e. expected production of the department, was 120 wheelbarrows that week, then:

Standard time for 120 wheel-barrows at $1\frac{1}{2}$ hours each = 180 hours

$\therefore$ Activity Ratio = $\frac{150}{180} \times 100 = 83.3$

An activity ratio smaller than 100 indicates that either fewer workers than normal had been used in the department, or that there was an abnormal degree of absence. An activity ratio greater than 100, might indicate the extent of overtime worked; if either becomes a general occurrence it will point to a possible need for changing the capacity of that department.

The use of these two ratios makes a diagnosis of the reasons for a production lower than that budgeted for, a rather simple matter. The use of these ratios in agriculture may have some advantage in explaining variances from the standard set due to certain fortuitous circumstances, for example, work being held up due to rain.

The foregoing practical example is essentially brief and superficial. It must be recognised that even under industrial circumstances there are considerable problems to overcome, mainly relating to the clerical work involved. Nevertheless, it is hoped that this has given some indication of what has been achieved in non-agricultural production.

## MANAGEMENT ACCOUNTING AND AGRICULTURE

Following on the management accounting system described above the question now is: to what extent can similar techniques be applied in agriculture? Before an effort is made to answer this question, it is perhaps useful to point out that, due to the nature of their organisation, commerce and industry have certain advantages over agriculture in the application of management accounting.

Firstly, uncontrollable factors, such as weather conditions, do not affect commerce and industry to the same extent as they affect agriculture. Secondly, the majority of farmers cannot afford to employ specialised staff for this purpose and are traditionally too busy ful-

filling many different job functions to do any more than the absolute essential paperwork themselves.

These points all tend to indicate that, as long as farming retains its present structure - a large number of small business units - management accounting will probably not find to any large extent the application in agriculture in the same sense as it has been applied in industry, except probably on very large farms and estates, and perhaps in highly specialised branches of farming, for example, dairying.

The fact does remain, however, that the cost-price squeeze which plagues farmers can only really be solved by increasing production efficiency and reducing costs, because public opinion, political factors, surplus production and international competition often forestall any increases in the prices that farmers may expect to receive. This increased efficiency is not possible unless the farmer has the where-with-all to compare new methods, eliminate inefficiency and reduce costs; this implies that intelligent record-keeping and some form of management accounting are essential.

If this state of affairs is accepted, how then can the development of farm management accounting progress, bearing in mind the difficulties encountered? The basis of all management accounting is the classification of costs and the departmentalisation of the business. The attainment of these basic requirements is not impossible in agriculture, while some form of budgetary control is also possible. The two prime problems which must be overcome are the setting of reliable standards and the administrative work involved.

It is possible, however, to undertake Time Study in agriculture with a view to setting standards. Such standards could also be computed by keeping fairly detailed records of labour and machinery used. This method will, however, be less satisfactory than the Time Study approach in that labour and machinery records do not allow for a detailed breakdown of times as is the case with time study, and do not take certain variables into account to the same extent.[7] Useful labour and machinery usage records will also take considerable time to collect. These records may, nevertheless, be used for this purpose. So also may "rule of thumb" observations, although these are, to say the least, rather inaccurate.

The standard costs eventually arrived at by using these methods could then incorporate a range within which costs could be expected to vary. Once costs move outside this range, management should take notice of these. Moreover, the use of efficiency and activity ratios could perhaps be used to explain variances due to any fortuitous circumstances that do occur.

The usefulness and application of management accounting depends partly on the frequency with which control need be exercised. In a factory for example, control could be exercised as frequently as necessary and inefficiencies could be recognised and dealt with almost immediately. To a farmer, however, weekly or even monthly control may sometimes be difficult to apply because of the rather longer period of most agricultural production cycles and the effect of extraneous influences. It should be possible, however, to divide cost centres or departments up in terms of the season in which a job is done. In maize farming, for instance, the different seasonal jobs such as soil preparation, planting, weed control, harvesting etc. may be regarded as different departments. Soil preparation again may be further sub-divided into cost centres corresponding to the specific operations of discing, ploughing, har-

7) For a brief discussion of the advantages of Time Study compared to labour records, see:
J.A. GROENEWALD and W.E. KASSIER. 'n Benadering tot die Verhoging van Landboudoeltreffendheid. (Paper at 4th Annual Congress, Agric. Econ. Soc. S. Africa, 1965)

rowing etc. with every tractor involved in say ploughing being a sub-centre. In this way, a farmer who grows maize on a large scale involving quite a few tractors (say 3 or more) and other equipment, could exert effective control over the work output (in terms of say morgen ploughed 10 inches deep) and the costs involved with each particular power unit. In this way, management accounting may also yield handy additional information which may be used for future decisions of machinery replacement and for rational choices in machinery purchases. This would be in addition to the benefits management accounting should yield in terms of higher operational efficiency.

Moreover, it will be found that, even in the production of highly seasonal products, more than one job is often done at the same time. A large-scale citrus farmer may, for example, have insecticide spraying for scale insects, irrigation, cultivation and fertilization done concurrently in different orchards. He may thus classify these as different departments - say a department of pest control, one of irrigation, two departments of cultivation (being done at two different spots) and a department of fertilization. Each will have its own peculiar problems, products and inputs. In pest control, for example, the farmer may be interested in an output of number of trees sprayed as well as gallons of water and pounds of insecticide used. In cultivation, he will be interested in an output of acres or number of trees or both. The same sort of output would also apply to irrigation and fertilization.

It is thus clear that reports have to be completed only as frequently as action can be taken. Under conditions of intensive agricultural production where control is necessary at a greater frequency than for extensive farming the additional benefits from management accounting should be proportionate to the additional paper work required.

We now turn to the problem of the administrative work involved in operating the system. It has been mentioned that farmers are generally too busy to be burdened with the details of operating a management accounting system. In addition, the fact should be accepted that most farmers are either scared of, or disinterested in, paper work. Large-scale farmers as well as large estates should not, however, be handicapped very much by this aspect. Quite a few corporative estates have trained accountants of their own, while others have accountants available who are normally employed by the financial groups owning these estates. Large-scale farmers who operate under different conditions than these estates, and whose scale of operations (although being large as compared with most other private farmers) is smaller, can employ semi-skilled personnel who can do the necessary routine paper work. It is our contention that in many cases, the benefits obtained from management accounting will more than offset the costs thus incurred.

The fact remains, however, that most of the farmers in South Africa do not operate on sufficiently large scales, or have such a type of organization, for the above mentioned procedure to find practical application. Therefore, in order to introduce management accounting in agriculture, and to enable more farmers to reap its benefits, the Government Departments and industrial bodies at the service of farmers may have to provide the functions that a cost accountant would provide in industry. These central authorities would be responsible for formulating simple record keeping systems for farmers of all types and also to set up standards which can be used for comparison. This idea is not new: agricultural economists and farm management specialists are developing record keeping programmes throughout the world. Cornwell[8] contends, however, that too much effort has been spent on trying to turn the farmer into an amateur accountant: "The few authoritative text books

8) S.V.P. CORNWELL. Management Accounting for Agriculture (Gee & Co., London, 1957) P. 35.

which have been published would seem to show a uniform tendency, which is also shared by agricultural economists, to try to make the farmer an accountant. They contain instructions on how to maintain and write up an analysed cash book, to prepare schedules of debtors and to draft annual accounts and balance sheets.

"Two comments are permissible. Firstly that this tendency is exactly the opposite of what has taken place in other industries where the recent emphasis has been entirely on making accounting statements and data more easily comprehensible to those without a specialized accounting training, whether it be the foreman on the factory floor, or the executive setting monthly production and cost schedules. The industrial accountant has felt compelled since the war to present accounts in a form which the director can understand and appreciate, whereas in agriculture only has there appeared this unfortunate emphasis on instructing the farmer how to keep accounts, rather than on instructing the accountant upon how to present the results in a form intelligible to each farmer. It is a fallacy to suppose that the average farmer, who actively dislikes paper work and already has too much of it can, simply by reading a text book, turn into an embryo accountant. The first requisite therefore for successful management accounting in agriculture, is to jettison any idea of making a farmer an accountant . . . . "

It should thus be clear that the record keeping systems which may be designed by farm advisers should require the minimum effort on the part of the farmer and that the emphasis should be more toward the interpretation of the data collected in terms of its use for management decisions.

There would appear to be a number of solutions to this problem.

Fairly minor modifications to the papers sent in by farmers in a few recently started mail-in record schemes by the Department of Agriculture as well as some private bodies, e.g. the Natal Agricultural Union, could render the accounts eventually produced to be very useful for some kind of management reporting. If each farmer were provided with a simple classification of costs for his farm, for example, labour, material, and expenses in respect of say pigs, maize, and dairying, or some stage in the production of such an enterprise, plus the services and overheads in each case, together with a broad list of items under each head, suitably marked reports or invoices sent in by the farmer could then be segregated by enterprise and cost classifications. An example of office procedure in the office of the centralised agency is given by Rades et al.[9] Obviously, quite a number of farmers would not be prepared to do even this, but this would just have to be accepted. It may well happen that the benefits reaped by the few farmers who co-operate in such a scheme may induce others to follow suit. As the programme developed it should also be feasible to build up a budget scheme by period of production for interested farmers against which their actual expenditure could be compared. This would in effect constitute a basic form of management accountancy which would not be too difficult to operate.

Apart from the purely accounting aspects provided by a service such as the above, it would be advisable for farm management specialists to embark on the collection of data which could eventually be used as a basis for standard costing. This would comprise the collection of physical input output data and would be most useful if the data were collected from farmers participating in the accounting scheme. In addition, such information could also be used for long-term planning using techniques such as linear programming and programme planning.

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9) R. RADES, E. CARSON & L. EISGRUBER. The 1964 Purdue Farm Account Project - Conversion to Electronic Account Keeping. (Purdue Univ. Res. Progress Rep. 157, 1964) Page 9.

Simple adjustments to some record keeping schemes may enable these schemes to yield quite reliable information on labour, machinery and material usage. Van Wyk's record book, for example, gives guides on how to keep such records for materials used for livestock and crops, as well as for labour and tractor use.[10] If such a system were adopted and used in conjunction with an accounting service it could well be possible to develop a system of completely integrated farm management accounts.

As an example of how such a service could operate, one may quote the National Agricultural Advisory Service in the United Kingdom. This body came into being in its present form in 1946[11]. Its function was then defined by its parent statute as being able to give "free of charge, technical advice and instruction whether practical or scientific, on agricultural matters". In the last six years, in addition to its original function, there have been definite developments on that side of its activities relating to economic and managerial matters.

For the execution of its functions the N.A.A.S. is organized with a headquarters and three other levels: Regional, County and District. Although the N.A.A.S.'s work is not confined to management problems (its district staff is primarily on the technical side) a series of training courses on farm management and economics is provided for the extension officers. In addition, agricultural economists are on the staff of the regional and headquarters offices. Their function, apart from liaising with the technical people, is to formulate standards for dissemination to the district field staff and to assist when more complex economic problems arise.

The N.A.A.S. does not undertake to do the accounts of farmers because the majority of farmers in the United Kingdom apparently are clients of accountants who co-operate in the presentation of the accounts in a form which the N.A.A.S. requires. The N.A.A.S. does, however, assist the farmer in analysing his accounts and making comparisons with standards. In fact the use of standards is an important factor in the operation of the whole service. The ratio of district officers to farms of approximately 1 to 1,000 makes it an impossible task for the district officer to visit each of his farms on a routine basis. The management accounting procedures and standards make it possible for him to visit only those farmers where a significant warning signal is shown on the management reports.

This system appears to be working very well and there is no reason why a similar system should not be developed in South Africa.

## SUMMARY AND CONCLUSION

In summary it may be said that while management accounting techniques cannot be applied in agriculture with the same degree of exactitude that they can be applied in industry, the need for some form of management accounting in agriculture nevertheless exists.

The basic rules governing the classification of costs, the departmentalization of the business, and the setting up of budgets and standards appear to be entirely possible in agriculture.

It is suggested, however, that because of the administrative problems and paper work involved the agricultural advisory services, rather than farmers themselves, will have to implement and develop management accounting systems for farmers.

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10) S.P. VAN WYK. Farm Record Book (Division Agric. Econ. Research, Pretoria) Registers 1B, 3A, 4B

11) CORNWELL, Op. Cit., P. 62.