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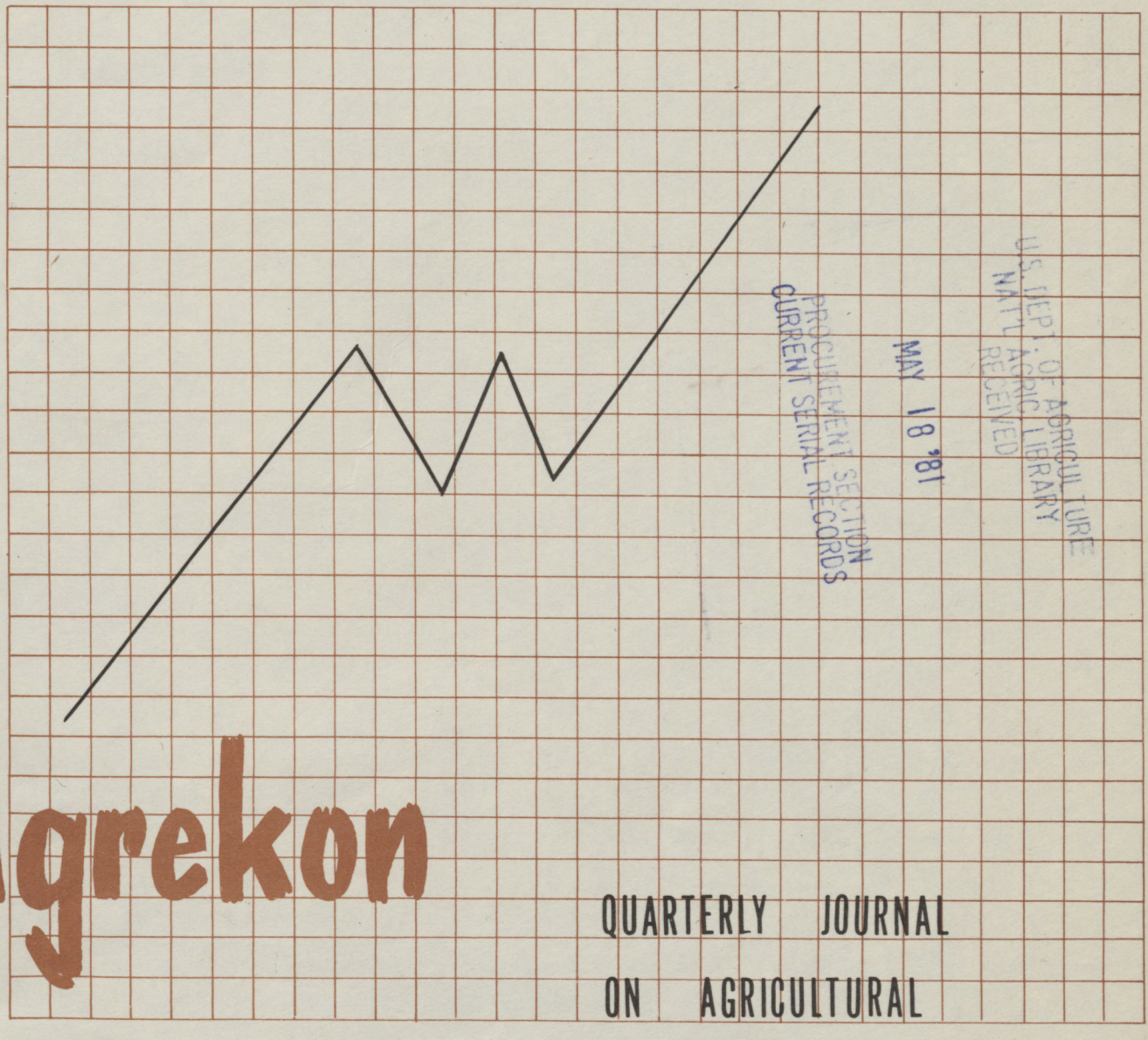

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RELATIVE EFFICIENCY OF LARGE AND SMALL FARMING UNITS

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Introduction

In its report the Committee of Inquiry into Rural Reform voiced its concern about the large number of non-viable farming units on the one hand and the unrestricted expansion of large land ownership on the other. It also made certain recommendations to combat both these phenomena.

Although too large and too small farming units are not only of importance in the field of economics but may have sociological and political implications as well, the question still arises how efficiently large and small units are farmed. Is the general view that size and efficiency go hand in hand also applicable to farming?

In this article we shall look first at findings in overseas countries regarding the correlation between size and efficiency. We shall then look at certain findings regarding the efficiency of large and small farming units in the RSA. Before we can do this, however, it is necessary to explain the meaning the term efficiency has in this article.

The term efficiency

The standard most generally used to measure efficiency is the *ratio* of gross income realised (output) to the cost of the production agents needed (input).

However, most farmers do not aim for maximum efficiency in this sense of the word. Instead, by far the main aim of farmers, in so far as it can be expressed in economic terms, is to maximise the difference between output (gross income) and input (total expenditure). Farmers therefore seek maximum total profit and not maximum efficiency as such.

By means of a simple example one can show that the terms maximum efficiency and maximum profit do not mean the same thing.

In terms of efficiency it is, for example, better to aim for an output of R28 000 with an input of R20 000 than for an output of R54 000 with an input of R40 000 because the *efficiency ratio* in the first case is 1,40 (28 000 ÷ 20 000), whereas it is 1,35 (54 000 ÷ 40 000) in the second case. Most farmers would probably choose the second alternative, however, because this would leave them with a profit of R14 000 as against a profit of only R8 000 in the first case. This article deals with the relative efficiency of large and small units. It is therefore important that the meaning assigned to the term here should be clear.

Overseas findings

Overseas literature indicates that the advantages of larger farming units in regard to efficiency were minimal a few decades ago and were limited to the enlargement of very small units to units of reasonable size, which could still, however, be considered relatively small. As unit sizes increased further, unit costs remained virtually unchanged. Once a certain size, which could still be considered relatively small, had been reached, efficiency tended to begin declining again. The main reason for this was that the output per unit of area began declining. This drop in yield per hectare was ascribed mainly to management problems and in particular to the fact that tasks could no longer be undertaken and completed in good time.

Mechanical innovations have made it possible to complete the various tasks more quickly. In recent years yields have therefore not shown a declining trend as soon as in the past. Once a certain size is reached, which is now much larger than previously, yields do begin to decline again, however. Improved technology and the larger variety of better, larger and more expensive implements, in particular, have also made it essential from a cost point of view for units to become larger in time.

Fixed costs have to be distributed over a larger area or over more yield units to keep the costs per yield unit competitive. Later studies accordingly conclude that large well-managed units are at present more efficient than small equally well-managed units.

On the basis of these findings certain British researchers have made the following recommendations:

> As large farms are more efficient than smaller farms a policy should be followed which will result in small and medium farms gradually being converted into large farming units.

Because the output per hectare tends to decline as farms become larger (but more slowly than the input per hectare) countries faced with agricultural surpluses ought to support and actively promote a policy of farm amalgamation. The converse policy should, however, be followed where food and fibre shortages are the order of the day.

Many researchers, however, feel that the available research results have not proved conclusively that larger farms are at present in fact more efficient than medium farms and if the results in fact point to this it is still doubtful whether size as such is solely responsible for this finding or whether it can be wholly or partly ascribed to other factors. It has been suggested that there is a correlation between farm size and management potential - that better managers usually have larger units.

It therefore follows that efficiency in the industry would not necessarily improve if a policy of farm enlargement were to be applied. In other words a farmer now farming on a relatively small unit would not necessarily farm more efficiently if he had a larger unit at his disposal.

Findings in South Africa

No studies have yet been undertaken by the Division of Agricultural Production Economics with the sole aim of determining the effect of size on efficiency. Such studies are extraordinarily difficult.

The first major problem is to find a reliable criterion for size. Area is generally used to indicate the size of a farming enterprise. The reason for this is that area is easily ascertainable (all farmers know how many hectares of land they have) and also easy to understand. The disadvantage is, however, that land has different uses - irrigation land, drylands, grazing, orchards, wasteland, etc. A hectare under irrigation can obviously not be compared with a hectare of grazing. A further disadvantage is that size does not give an indication of the quality of the land and vegetation. Total farm size is therefore often an unsatisfactory criterion for the comparison of the sizes of farming enterprises. Total capital investment is a better criterion as pieces of land with different uses and of varying qualities can be valued differently. It also takes into consideration not only the land but the number and quality of livestock and implements available as well. The main problem is, however, that capital investment is difficult to ascertain. The correct valuation of assets is a complicated matter.

A second problem is that the quantity and quality of other production factors - working capital, labour and in particular management - may have a major effect on the analyses. Many other factors must also be borne in mind to avoid incorrect inferences being made.

The findings mentioned here arise from some of the farming surveys and mail-in records analyses conducted by the Division of Agricultural Production Economics. These results can at best serve only as an indication of the relative efficiency of large and small farming units. It is, however, significant that the findings obtained correspond to findings in certain overseas countries.

Three types of farming were investigated - extensive stock farming, semi-intensive dryland grain farming and intensive irrigation farming.

As regards extensive grazing areas, and more specifically sheep farming in the Karoo and cattle ranching in the northern parts of South-West Africa, the results indicate that efficiency rises consistently as units become larger. It must be accepted that at some or other stage a turning point is reached and that once this point has been reached efficiency will tend to decline. This turning point fell outside the size limits of these two studies, however.

The fact that efficiency increases uninterruptedly as extensive stock farming units become larger (within the limits covered by these studies at any rate) has certain implications. In these areas or other similar areas the economic aims of maximum efficiency may conflict with rural sociological and national security aims.

Results of more intensive types of farming, such as irrigation farming at Vaalharts and dryland grain farming in the Eastern and North-Western Free State indicate that efficiency rises considerably from those farmers farming on relatively small units to those farming on medium units. As units enlarge further, however, efficiency tends to decline again and the efficiency of farmers farming on relatively large units is not significantly higher than that of farmers farming on relatively small units.

It is true that inputs per hectare usually show a declining trend as units enlarge further from medium size. It is, however, doubtful if this drop can be ascribed exclusively to the better utilisation of surplus capacity (labour, implements and equipment). It is suspected that costs connected with implements in fact increase in some cases without a corresponding drop in labour costs. Because of the larger total profit on larger farms some of these farmers may invest too much in implements in order to lessen their tax liabilities. The decline in input per hectare of some farmers is the result of reduced expenditure on, *inter alia*, fertiliser.

The reason for this may be the relatively high risk with which these farmers have to contend and/or a lack of adequate working capital, but the fact remains that the output per hectare tends to decline at a more rapid rate than the input as units increase from "medium" to "large". Management problems, especially quick decision making, supervision and timeliness may also be largely responsible for this.

Big farmers may possibly also be less set on strictly monetary aims. The possibility can also not be excluded that the inherent potential of larger farms may generally be lower than that of medium and small farms.

From the point of view of maximum utilisation of the available inputs, which are naturally always scarce, the results indicate that farms ought not to be too small or too large.

From the point of view of supplying food to a growing population the available information does not provide consistent and adequate proof that the output of small units is higher than that of medium units. With good management and adequate working capital a medium unit should meet both requirements - namely maximum efficiency and optimum output per hectare.

Because, in addition to size, many other factors have an effect on efficiency, William Cowper's observation that "variety is the very spice of life" is as applicable to agriculture as to any other field and there will always be a wide range of farm sizes next to each other, managed by farmers who are equally divergent as regards their management potential and aims, and maximum efficiency may be only one of many of these aims. Available information, however, indicates that from an efficiency viewpoint *absolutely* small and *absolutely* large farms are usually disadvantageous to the community as a whole.

The majority of farmers are not trying to achieve maximum efficiency. Their main aim, in so far as it can be expressed in economic terms, is maximum total profit. Results indicate that total profit rises consistently, although at a declining rate, as units become larger. If this larger profit were, however, to lead to unnecessary and ill-judged investments in implements, equipment and fixed improvements, or to the purchase of more land at unreasonably high prices so as to be able to make further investments in livestock, improvements, implements and equipment, in addition to the interest costs incurred, in order to decrease tax commitments, it would not be in the interests of agriculture as such nor in the interests of rural areas and the country as a whole.

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