LANDBOUW-ECONOMISCH INSTITUUT
DEN HAAG (Schev.) - VAN STOLKWEG 29 - TELEFOON 51.44.81 - GIRO 41.22.35
TELEFOON No. AFD. BEDRIJFSECONOMISCH ONDERZOEK LANDBOUW 55.30.00

A 10

MEASUREMENT OF LABOUR-INPUT FOR COST STUDIES

by Prof. J. Horring
Agricultural Economics Research Institute

The economic action of the entrepreneur consists in the continuous weighing of costs and returns against each other. Therefore, calculations in this field include mainly costs and expected returns. When we view the measuring of labour in the light of these calculations of costs, it is clear that ultimately labour costs are concerned, so that the problem of measuring at once falls into two parts:

1. the determination of the labour time,
2. the evaluation of labour.

Further it will be useful to distinguish between:

1. the determination of the actual physical quantities of labour and labour costs, such as they are or were (ex-post determination) and
2. the determination of labour demand in the near future (ex-ante estimates or budgets).

The relation between the two categories is that ultimately all management - so decision-making - is based on the expectations about the factors concerned, but that the basis for these expectations is partly provided by experience. Research work will, in the first instance, include the establishment and the analysis of the facts of the past and then it will project these into the (near) future. However, the choice of the object to be observed is determined by the need of farmers, who use the results for making ex-ante decisions, which are based or should be based on budgets of costs and returns expected.

First and foremost we should investigate for what purposes calculations of labour costs are necessary and, after this, find out what data are required for this purpose. At the outset it should be noted that labour costs occupy such an important place in cost-calculations, since they generally constitute more than 1/3 of the total costs on the Dutch farms and, further, as labour, even when

already tied to the farm, has far more alternative applications realizable within a shorter time than most other means of production. In consequence, in the sphere of labour the demand for the most remunerative application is more urgent and of more frequent occurrence than with other means of production. Once the latter have been acquired, their use is almost entirely determined and restricted to one or a few applications. On the other hand, the application of labour once available - and this applies not only to human labour, but also to horse or tractor labour - brings along many possibilities and, consequently, many choice-problems, about which afterwards some remarks will be made.

The purposes of costcalculations in the Netherlands mainly fall into twe groups, viz:

a. for determination of producer's prices of agricultural products and other agricultural political measures,
b. to create a basis for improvement of farm management.

The purposes of these two calculations are different so that also the requirements set to labour-recording, will differ accordingly.

Costcalculations for the purpose of the agricultural policy

The purpose of costcalculations for the price policy is to gain an insight into the amount of the costs on reasonably-well-managed farms. From this it follows that in the first place as labour amounts should be considered the average amount of actually consumed labour for direct operations for crops or other products to which cost-calculations may relate. Besides, for any crop or product a share in the labour time, not employed for a particular crop or product, but for the farm in general should be brought into account. As it is not always easy to find the right keys for division, this splitting up of general costs often creates difficulties.

Such calculations for the purpose of the agricultural policy do not relate to minimum amounts of labour required, but to such average amounts as are normally used on reasonably-well-managed farms. Further, the emphasis is on the principle that the total labour time

employed on the farm should ultimately be charged against all the products yielded by the farm, rather than on labour times required for detached operations. So this means that all times, spent for going to the fields, for adaption and preparation, should be included in the total time. Further, it means that labour conditions should be normalised, although special conditions greatly affect the actual times. And, finally, that a choice will have to be made with regard to methods by which a particular operation has been performed, since it is wrong to bring various work methods indiscriminately into account.

The price of the labour to be brought into account, should also be based on normal conditions; generally wages are based on the current rates of the collective labour agreements and the additional social security costs on the regulations in force.

Costcalculations for the purpose of farm management

The purpose of calculations for farm management is widely different from the purpose of calculations for the agricultural policy. In the former case the aim is to determine the costs in given concrete alternatives on a particular farm and at a particular moment. In genral, this means that the cost allocation, which is essential in calculations for the agricultural policy, is not necessary and may even be faulty.

Of great interest in the caloulations for farm management is the question whether labour is available or not. For convenience's sake we may here distinguish two categories, viz:

1. cases in which all labour is supplied regular staff,
2. cases, in which is considered to supplement the regular staff by casual labour in peak periods.

On family farms as well as on the other holdings, where only a regular staff is employed, the main problem is not the hiring of casual labour, but the utilization of the labour available on the farm, so the most remunerative application of this available labour.

This problem especially plays an important rôle, when in certain periods several operations compete for the use of the labour available. For the judgement of the labour requirement of any crop or product in any period, knowledge of the seasonal distribution per crop is necessary. To this end also the total labour requirement (so including all additional times) should be known.

So on the farms with only a regular staff the principal aim is to find a balance between labour demand and labour supply (the available labour) through a harmonious relation between cropping programme, livestock numbers, etc., on the one hand, and the available labour, on the other hand. In these problems the physical quantities, rather than the cost of labour is concerned, since a regular staff means fixed costs. Therefore, the costs of the permanent labour supply may be left out of account for calculations that relate to various alternative methods of farm-management, it being the aim to obtain the highest possible returns with the available labour supply.

For ex-ante calculations relating to the labour requirement, it is required to know for each crop the normal man-hours per operation distributed over the various periods. Deviating conditions in a given year can only roughly be taken into acoount by using standards in which a certain risk factor has been passed on.

If the employment of casual labour is considered in certain peak periods, it is necessary to know the quantities of labour normally required for budgeting the amount of casual labour to be hired. In such calculations, however, the price of the labour is far more important than in the previous cases, since, in fact the price to be paid for casual labour is largely dependent on the situation in the local labour market, in consequence of which in certain periods, in which there is a shortage of labour on all farms, the wages are greatly affected by the supply of labour.

Consequently, as the price of such labour is determined in a market, the maximum price that the farmer can pay for the performance of specified operations, is the loss of returns that would arise from the non-performance of these operations. In the determination of

this limit of the value of the casual labour to be employed by the farmer, account should be taken of the shifting of less important operations in the period concerned, while, besides, the risks attached to changes in the weather conditions should be taken into account.

Generally, there are for the employment of casual labour in such peak periods several possibilities. Besides the hiring of casual labour, also overtime labour of piece labour can be done by the regular staff. In addition, an extension of the regular staff may be considered to minimize the dependence on the labour market in peak periods. The general result of this extension of the regular staff is that there will develop a surplus of labour in definite periods especially in the winter period. It may then be economically justified to utilize this surplus of labour for the performance in winter of operations that were formerly done by the contractor, for instance the rippling of flax, repairs of equipment and farm buildings and treshing of grains.

In these problems we distinguish between short-term and long-term decisions. In particular for the short-term, where the estimation of the labour requirement is easier and more accurate than for long term budgets it is necessary to have an insight into the effect of the separate operations on the returns of crops and livestock. Regard should here be had to the effect on the quantity, as well as on the quality of the products of the farm. Therefore these effects deserve the utmost attention.

Problems of long-term labour provision may be considered to come within the sphere of general farm organization, which should be well distinguished from day-to-day farm management problems. Generally, with long-term problems fewer detailed data will be available than with short-term calculations, because the number of still unknown circumstances affecting the actually required labour time, is much greater than in the case of short-term decisions.

Also for calculations relating to the hiring of casual labour in peak periods, so in the case of short-term decisions, it is of great importance to know the normal total labour requirement per crop

per period, as also here it is desirable to bring into account the total hours inclusive of all additional hours, etc., rather than the specific hours for the operations concerned.

The underlying principle of the above is that in all these decisions the guiding consideration of the farmer is a high profit, so purely private-economical. Therefore, every alternative in farm management should be judged on its significance for the profit and any change in farm management that would lead to a decrease of the profit, should be abandonned for that reason.

From this it follows that the concept of labour productivity (here taken in the sense of gross output per man) in production economics can only occupy a very limited place. As farm production requires both capital and labour, the reference of the total production to either of these factors can only give a partial insight into the results of the production. It appears, however, that with stationary, or decreasing total costs the increase of labour productivity is justified, as this also increases the profit on the farm and we start from the principle that the private-economic aim of farm management is a profit as high as possible. So this means that rationalization of production without extension of the production machinery is always justified from a farm-management point of view. If, on the other hand, the increase of labour productivity is achieved by increasing total costs, it can no longer be said that, generally, the increase of labour productivity should be one of the aims of farm-management research. In such cases it should first be ascertained whether the increase in labour productivity is indeed attended with an increase of the profit, which, in fact, need not necessarily be the case. In farm-management train of thoughts the increase of labour productivity cannot be an aim in itself, as the aim of the production is to obtain a profit, no matter the size of labour productivity. From a national-economic point of view the increase of labour productivity may be seen as an aim in itself, when labour is relatively the scarcest factor and when it is the aim to increase the national product by utilizing the labour factor as effectively as possible.

Also other-more technical-standards for labour productivity cannot take the place of the profit, as in principle, the same drawbacks are here attaching as for the production per man in terms of money. Further, it is often difficult to reduce the yields of the various products to one common denominator. The drawback of the expression of the total production in terms of "starch equivalent units", which is customary in Germany, is that not all crops are grown for starch (for instance, flax, fruit and vegetables), so that the conversion into starch equivalent units is an artificial operation. Further, the costs of production of a starch equivalent unit, are not the same for all products, which has to be left out of account (with the exception of corrections for the purchase of seed for sowing and of feedingstuffs).

In the Netherlands it is usual to calculate the socalled labour effect, which is the quotient of the total number of standard hours on a farm and the number of available workers. This number of standard hours is here calculated on the basis of standards for the labour requirement per crop or per product. Against this method also some objections can be made, namely, first, the fact that this number of standard hours does not stand for the total production, but for the labour requirement and, further, the practical drawback that it cannot be ascertained whether the work methods on the farm in question fully correspond with those to which the standard refers and whether equal care has been given to crops and livestock. Consequently a high number of standard hours per man (labour effect) cannot always lead to the conclusion that, on a given farm, labour has been efficiently applied, since a high number of standard hours per man can also be attained at the cost of the quality of the work.

Summary

From the above considerations regarding the purposes of cost-calculations result various conclusions for measuring of labourinput follow:

1. From this survey it appears that the data concerning the labour requirement that are necessary for the calculations for farm-management purposes only refer to the total hours per operation as spread over the successive seasons. To this end, on a limited number of farms the Agricultural Economics Research Institute maintains detailed time records from which the total number of hours per operation per crop are calculated for the various farms. The requisite basic data are supplied by the farmer himself to the nearest half hour. Besides, as far as possible, records are kept of the circumstances under which and the dates on which the work is carried out and the work methods used. This renders it possible to determine the normally required labour hours for the various operations on the basic of the data of several years.
2. From the above it results for the farmer that the use of labour saving equipment is only important for him, when the saving of labour actually decreases the total labour costs. So it is not efficient to ascertain that a more expensive machine decreases the cost of a given operation, because it saves labour hours, but, in addition, it will have to be ascertained for every concrete case whether this saving of labour time is actually attended with a saving of labour costs. Only when the decrease of labour costs in the concrete case exceeds the increase in the costs of machinery, is this type of mechanization more profitable for the farmer concerned. It needs hardly be said that, if the use of a machine does not result in a corresponding decrease in labour costs, but does result in a sufficient increase of the gross output on the farm as a whole (whether as a result of the increase of the physical yield of the various crops, or as a result of the change in the organization of the farm owing to machanization), this will also justify the change to another work system.
3. Consequently, it is for the farmer more necessary to know the total actual labour requirement per cultivated hectare for making short-term, as well as long-term decisions than to know only the specific labour hours for a specified operation. He cannot make right calculations about the actual labour requirement on basis of this latter.

4. As the costs calculated for the purpose of the agricultural price-policy are based on the circonstances prevailing on the reasonably-well-managed farm, it is also for this purpose necessary to know the normal labour requirement, including additional times.
5. The increase of the labour productivity on the farm never is a purpose in itself, but is only justified from the farm management point of view, if it is attended with an increase of the profit. Otherwise, any method for the determination of labour productivity has its own drawbacks, resulting from the method of calculation itself.