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## SPECIFIC PROBLEMS OF COST ACCOUNTING IN AGRICULTURE\*

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**Summary:** This paper presents specific problems of cost accounting in agriculture. The essence of the distinctiveness of agricultural activity lies in the biological nature of the carried out production and the dependence on natural environment. The valuation of biological assets by fair value that is required in agriculture accounts for the result on production, not on sales. This results in the necessity to review both the approach itself to calculating result categories, and the employed cost accounting methods. A properly constructed cost accounting system in agriculture should be, on the one hand, oriented on measuring the costs of operating management process and short-term profit maximisation (economic year), and on the other hand support the strategic management processes and maximise the value of an agricultural farm in the long term.

**Key words:** agriculture, cost accounting, accounting, management.

### 1. Introduction

Agriculture exhibits its specificity against the background of the entire national economy. The essence of the distinctiveness of agricultural activity lies in the biological nature of the carried out production and the dependence on natural environment. Significant differences occur in the economic and financial area at the stage of records kept for the purposes of cost accounting and determining the financial result. This was expressed in the preparation of a separate International Accounting Standard No. 41 "Agriculture", which governs the principles of valuating biological assets by "fair value", and not by production variable/full costs. This is a very important arrangement that imposes a different view on the preparation of cost accounting in agriculture.

As it was proved by Kondraszuk [2010, p. 93], "While valuating by fair value, we assume accomplishing a profit at a certain level. This constitutes a departure from the principle of historical costs and the principle of accomplishing". This results in

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the necessity to review both the approach itself to calculating result categories, and the applied terms. The use of fair value for valuation of finished products (production) can be considered as a permissible solution in the conditions of agricultural activity. However, one should be aware of the impact exerted by this approach on the appraisal of the financial position of an enterprise both on cost accounting while determining profitability and on the remaining components of the economic and financial analysis, including in particular the liquidity ratios of farms. One cannot agree with the statement [Franc-Dąbrowska 2008, p. 57] that “The specificity of an agricultural enterprise should be considered in the organisational area, not in the financial aspect, hence financial liquidity in agricultural farms should be estimated from the point of view of the literature optimum”.

The use of fair value while measuring profit affects the type and scope of economic records at the “ex post” stage. It proves that there is no need to keep detailed records and calculate unit costs of produced goods. According to Kondraszuk [2010, p. 99], “The use of fair value may also be significant for determining the taxable base for the income tax in agriculture that is planned in Poland”.

The problems related to cost accounting and the proper accounting system for the purposes of management have been addressed for a long time in the economic and agricultural literature<sup>1</sup>. Agricultural economists expressed the conviction that the principles of cost accounting (in general – results) could not be transferred from non-agricultural activity (industry and trade) to agriculture. The main reason of such a situation should be the “organic” nature of an agricultural farm, since close mutual relations between individual divisions, branches and activities prevent exact determination of the amount of costs and revenues from a single crop or animal breeding. The calculation of “full” unit costs of agricultural products was criticised as being labour-intensive and at the same time useless for valuating biological assets and making decisions. Manteuffel [1984, p. 253] wrote “... the calculated amounts of unit prime costs do not reflect the economic reality, are misleading, therefore they cannot constitute grounds for making decisions, both on the scale of individual enterprises and the entire agriculture sector. They constitute only a kind of smokescreen which in certain cases facilitates justifying various false decisions. These are an expression of woolliness in the application of the pretended cost accounting”. Those theses were continued and developed by inter alia Ziętara & Kondraszuk [1987], Kondraszuk [1987a, 1987b] and Kondraszuk & Ziętara [1988]. When making decisions, farms analyse above all direct/variable costs directly affecting the volume and value of production. Based on that, it is possible to employ

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<sup>1</sup> Already in the late 18<sup>th</sup> century, when agricultural activity began assuming the form of enterprises from feudal forms, the achievements of the traditional agricultural accounting which calculated the result of activity for the entire farm (single, synthetic accounting) began to be denied in favour of a more sophisticated merchant accounting (double, analytic accounting) which enabled calculating the profitability separately for individual divisions, branches and activities. In this system the result for the entire farm was calculated by summing partial results (so-called double accounting).

simplified differential calculations that enable a farmer to select one (better) of two compared variants. Recently first attempts have appeared to employ such concepts of cost accounting in agriculture that are applied in other industries. The problems as to adapting time driven activity based costing (TDABC) in agriculture are presented by Kondraszuk [2010, p. 211-219].

The close correlation of agriculture with the environmental conditions presents the modern agriculture with additional tasks. Agriculture must be considered not only from the production and economy perspective, but the social and environmental context is also very important. Farmers become the guardians of environment and should be treated as “conservators” of natural resources. In this situation the broadly understood cost accounting in agriculture should take into account also environmental indicators and the principles of sustained growth. The concept of “sustained growth” does not constitute applicable law but it has achieved the rank of international applicable standard of conduct as a result of agreements concluded by the majority of world countries. The primary idea of sustained growth amounts to the growth that satisfies the needs of today’s societies, at the same time not limiting the capacity to satisfy the needs of future generations.

The primary goals of research as part of the implemented grant are as follows:

- to analyse the existing state of development of cost accounting in agriculture,
- to determine and analyse trends of changes in cost accounting in the general theory of enterprises,
- to make an attempt to adapt modern cost accounting methods for the purposes of agriculture in the conditions of sustained growth.

This paper is an attempt to present the specific problems of cost accounting in agriculture and the directions of seeking a solution thereof. The paper employs the method of analysis and synthesis as the primary method at the stage of literature research, while the deduction method was selected as the research method at the stage of reasoning.

## **2. Costs as a core economic category**

In the conditions of market economy in agriculture, the law of supply and demand is reflected in the behaviour of prices for means of production and products. In Poland, the influence of farmers on price behaviour is unfortunately small. They form a group of almost two million dispersed producers, opposed by well organised agricultural produce purchase entities and supply enterprises, which are often monopolies on local markets. The only chance for farmers is the strategy of minimising the production costs. Currently farmers bear the entire risk of failures on the agricultural produce market and must accept the often monopoly-like practices in the area of supply with means of production. A properly constructed cost accounting system taking into consideration economic, environmental and social goals will be a very

useful tool in creating an agricultural policy. It might also become the beginning of the construction of “fair trade”<sup>2</sup> in the agribusiness.

Cost accounting has been used since the dawn of time. Any choices are made based on more or less sophisticated cost accounting, which is opposed by the earned benefits. The modern cost accounting dates back to the second half of the 19<sup>th</sup> century, when the theory of economics and organisation of enterprise developed and cost accounting became a component of the accounting system.

However, a huge variety could be noticed in recognising and accounting for outlays and costs between agriculture and trade and industry. The so-called merchant accounting was not accepted in agricultural farms. Attempts to implement it in agricultural farms failed and the simplified variant of single (synthetic) accounting based on the cameral system was still in use. It amounted to registering balances and turnovers in naturalia, with simultaneous recording of changes of cash balance. This method is currently defined as cash method, as opposed by the generally applicable accrual method.

The optimum shape of the organisation of a farm and the used technologies require finding such a last outlay unit that in given circumstances will be still profitable. The production from the given activity should be expanded so that the marginal revenue on the expanded production equals its marginal cost. The mutual combination of production factors, in turn, is that every marginal revenue remains in the same relation to one another like the marginal costs of use of those factors. In the theory of economics, marginal revenues and marginal costs are usually treated as mutually corresponding values. The marginal revenue is referred to the last outlay unit most often measured in cash, while the marginal cost to the last product unit, also measured in cash. In contrast, due to limited resources one used to refer both of those values in the economics and organisation of agricultural farms to the unit of the possessed production factor that was on the minimum (land, labour, capital).

On the occasion of changing the intensity of cultivation of individual crops or animal breeding, revenues or costs are generally referred to the production unit (l of milk, kg of livestock, dt of cereal, etc.), or to a unit of means of production, whose outlay should be decreased or increased. On the occasion of changing the direction of production, in turn, such a factor (production potential) should be chosen deliberately as the reference factor that constitutes a “bottleneck” in the given circumstances (is on the minimum). Such a factor is regarded as the limiting one that limits the expansion of activity in a farm most effectively and that for the use whereof

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<sup>2</sup> The notion of “fair trade” is a relatively new (J.E. Stiglitz, A. Charton, *Fair trade*, PWN, Warszawa 2007). The task of “fair trade” is to create new opportunities for the economically organised enterprises and to act for the transparency of management and keeping accounting, the creation of potential which increases the independence of producers, the transparency of settlements, repayment of liabilities and use of “fair” prices, equality of genders, safe work conditions and environmental protection.

the greatest number of considered activities compete. In plant production, most typically it will be the available land area. In certain circumstances revenues and costs may be also referred to outlays of manpower (man-hours). It should be remembered, though, that man-hours required by individual activities can be mutually exchangeable only when the labour demand concerns the same period.

For the purpose of animal production, the inventory post, main feed area, man-hour, etc. may serve as the reference factor. The amount of marginal revenue and the structure of marginal cost change in line with the selection of the reference factor and the type of production expansion. It should be noted that in a general case the marginal revenue comprises primary revenues as well as incidental performances whose value (valuation) depends on the relations between the divisions, branches and activities in a given farm. It is very difficult to value such revenues appropriately and this requires great knowledge and experience from the person making the calculation. The marginal costs, in turn, comprise variable costs (continuous and incremental) of production, as well as the so-called stranded benefits which depend on the number and competitive strength of the competing activities, as well as on the type and number of means of production that are limited in the considered moment.

From the point of view of a farm, incidental performances and stranded benefits are actual revenues and costs, which are directly reflected in the results achieved by the farm.

In agriculture, particularly in plant production, maintaining the equilibrium of biological factors causes many problems. Increasing outlays corresponds to decreasing production in relation to the incurred unit outlays. The law of variable efficiency occurs in plant production as the law of decreasing income from land. Maintaining the equilibrium of organisational and economic factors is equally troublesome and results in the law of decreasing income extending on the entire farm. The Liebig's law of the minimum, which initially provided that plant yield hinged on the factor that was the least in terms of quantity (minimum) in relation to the demand, directly applies here. However, it can be easily extended on the entire organisation and economics of a farm.

### **3. Farm fit-out level – indirect (fixed) costs as the decisive factor in increasing the effectiveness and scale of production**

The large scale of production during the period when large-area State Agricultural Enterprises operated was associated rather with uneconomical and ineffective actions. However, the law of "economy of scale" itself has not become obsolete. Obviously, the scale of production in an agricultural farm is relative. The proper cost accounting permits choosing optimum economic decisions. It is a farmer's tool for determining both the structure and the intensity of production. The decisions as to the fit-out and production potential of a farm are assuming significance. The incorporation thereof into the field of cost accounting results in the necessity to

expand the traditional accounting, based on direct and variable costs, by indirect and fixed costs. So far the economic and agricultural literature has drawn attention above all to the unskilful division of costs into variable and fixed costs. Taking fixed costs into account in calculation led to a “deformation” of the obtained results and making wrong decisions. Thus, attempts have been made to allocate costs (potentially variable) properly to the considered problem at any cost [Kondraszuk, Ziętara 1988].

In the case of each farm, a statement of revenues from individual activities should bring the answer to the question: which of them prevail and constitute key revenues from the point of view of the entire farm. A desirable feature of the key revenues is their stability and high profitability. One should strive to increase the scale of production of the key activities and to eliminate the marginal and less profitable activities as far as possible. The person leading the farm should devote such a percentage of time to the given activity that corresponds to the share of income obtained by a farmer.

In the case of a greater scale of production fixed costs decrease in terms of a production unit. This is a very desirable phenomenon which considerably affects the economic results of farms. Nevertheless, the following questions arise:

1. Can the cost of operation of one tractor-hour with a low use of the tractor, said cost burdening the cost of potato cultivation, lead to the unprofitability of such cultivation (apparent or actual)?
2. Should a farmer abandon cultivating potatoes?
3. What cost accounting should be applied in this case?
4. What should be done (what decisions should be made) in order to improve the situation?

It should be remembered about the limited nature of the agricultural farm, which is manifest in the correlations between individual activities, branches and divisions. This particularly concerns certain activities managing the side products of other activities which are not an object of trade in goods. Therefore, it is often the case of complementary instead of competitive relations between selected activities. The relations via manure, own feeds, posts in rotation, balance of labour and financial funds are counted as the most important organic correlations in a farm.

The two latter correlations impel the farmer to take into account the demand for labour and pulling force as well as cash flows from individual activities, while selecting farming directions. The problem of selecting an optimum structure of production in a general case becomes difficult and possible to solve only with the use of mathematical models. However, in practice the choice between individual activities for a given farm is strongly limited and everything depends on the “feel” of a farmer who makes the final decisions taking into account own preferences and predicting the level of future prices.

## 4. Conclusion

The biological nature of agricultural production and the mutual correlations of individual activities (the organic nature of the farm) cause that the division of general production costs and general management costs are burdened with great subjectivity. The issue of preparing a cost accounting system in agriculture has not found a solution yet. The literature concerning the non-agricultural (trade, industrial, etc.) activity provides a lot of proposals as to cost accounting systems. The question whether and within what scope the cost accounting used in the theory of economics of enterprises could be adapted to the circumstances of agriculture still remains unanswered. This is a very significant issue from the microeconomic point of view since agricultural farms are treated in the same way as other enterprises and they are subjected to strong competition within the European Union. Advanced cost accounting is to become a tool enabling to increase the effectiveness of the carried out production. This issue is particularly important also from the macroeconomic perspective since food prices, as well as the condition of the environment and the maintenance of permanent environmental resources that guarantee the existence and development of societies, are important for the society. In the situation when agriculture is subsidised from the state budget and the European Union, the knowledge of production costs constitutes a very important piece of information justifying the use or the cessation thereof. The system developed for the agricultural policy should permit determining the appropriate level of subsidies for production and the application of other financial instruments in order to offset costs and the profitability of the production carried out in varied regional conditions.

A properly constructed cost accounting system should, on the one hand, be oriented on measuring the costs of operating management processes and maximising the profit in the short term (economic year), and, on the other hand, support the strategic management processes. This will allow to create proper potential for generating income in a farm, as well as to maintain competitiveness in the long term (permanent development) and increased value for stakeholders (customers) and farmers (owners).

## Literature

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## **SPECYFICZNE PROBLEMY RACHUNKU KOSZTÓW W ROLNICTWIE**

**Streszczenie:** W artykule przedstawiono specyficzne problemy rachunku kosztów w rolnictwie. W porównaniu z pozostałymi działami gospodarki narodowej rolnictwo jest specyficzne ze względu na biologiczny charakter produkcji i uzależnienie od środowiska naturalnego. Wymagana w rolnictwie wycena aktywów biologicznych, która jest prowadzona według wartości godziwej, uwzględnia wyniki produkcji, a nie sprzedaży. Powoduje to konieczność weryfikacji zarówno samego podejścia do obliczania kategorii wynikowych, jak i stosowanych metod rachunku kosztów. Właściwie zbudowany system rachunku kosztów w rolnictwie powinien z jednej strony skupiać się na pomiarze kosztów procesów zarządzania operacyjnego i maksymalizowania zysku w krótkim okresie (w roku gospodarczym), z drugiej zaś powinien wspierać procesy zarządzania strategicznego i maksymalizować wartość gospodarstwa wiejskiego w długim horyzoncie czasowym.