Changing World, Unchanging Accounting? Cost Systems for Hungarian Agricultural Companies

ZOLTÁN MUSINSZKI, Ph.D.
ASSOCIATE PROFESSOR

e-mail: stmusiz@uni-miskolc.hu

SUMMARY

The literature of agricultural cost accounting has defined the definition of cost centres and cost bearers, the contents of the accounts, the procedures and methods for cost accounting and unit cost calculation without any significant changes for decades now. Do the agricultural companies set up and operate their own cost allocation and unit cost calculation systems on procedures made for state owned farms and cooperatives, or do they align their cost system with the challenges of our times? This study investigated the answer by questionnaires completed by corporations, limited liability companies and cooperatives.
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METHOD OF RESEARCH

There are no national or international procedures for setting up an accounting information system satisfactory for management. The Accounting Act leaves it to management discretion to choose what information they need besides the statutory data stipulated by this act, as well as the operation and utilisation of accounting to provide the accounting information needed for decision-making support and preparation.

With the Accounting Act coming into effect, it was enabled to simplify and change the decade-long practice of cost accounting. Besides the obligatory grouping cost by cost types, cost accounts 6 and 7 can be used for providing management information, if the farmer decides to do so. The free usage of cost accounts enables companies to allocate items to divisions, as well as setting up their own cost management and unit cost calculation systems.

Despite the changes in social, economic and legal environments, agricultural cost accounting literature still is based on the procedures and methods set up for state owned companies and cooperatives in the era of legislative level regulation. Would the response of agricultural accounting to the challenges of the new era be leaving everything unchanged?

I prepared a questionnaire to answer this question, which was aimed at elaborating the costing and prime costing calculating practices of agricultural companies. The first group of questions deal with the allocation of agricultural activities' costs; getting details of the cost groupings, the setting up of cost centres and cost-bearing, also about the ratios of allocating and re- allocating costs.

The second group of questions related to the unit cost calculations for biological assets and agricultural products, including the scheme and details of cost calculation, defining the value of elemental damage and secondary products, the unit cost calculation of the living weight, and the analytic recording of costs.

In the third part of the questionnaire focusing on the cost accounting and unit cost calculation I was looking for the answers for the following questions:

- how important the agricultural companies consider the factors affecting the operation of their costing and prime costing systems to be,
- how they evaluate their current costing and prime costing systems,
- in which areas of their current costing and prime costing systems they plan changes.

The fourth group of questions related to the organisational and technical background of cost accounting and unit cost calculation.

Lastly I examined the common features of the economics and accounting of the businesses.

The completion of the questionnaire took place in February and March 2008. I posted the questionnaire to 150 Hungarian companies and got it back filled in from 74 companies. The returned forms I considered to be useful – and complying with the current regulations – if the company is an incorporated, limited company or a cooperative pursuing its activity under the Accounting Act. In all, 28 corporations, 22 cooperatives and 16 limited companies provided useful data. About half of the

companies were mixed activity farms, 19 were crop growing farms, 14 were animal breeders, and one could not be categorised due to missing information.

SETTING UP AND OPERATING COST ACCOUNTING AND UNIT COST CALCULATION SYSTEMS

In the first part of the questionnaire the questions related to the accounting of the agricultural activity costs, in the second part to the unit cost calculation of the agricultural products.

Table 1. Grouping costs according to the number and ratio of 'yes' answers

Cost group	Frequency	%
Cost type	66	100
Cost centre/cost bearer	64	97
Direct/indirect cost	64	97
Fix/variable cost	14	21
Other	0	0

Source: Author's calculations

Agricultural companies follow the accounting regulations when grouping their costs. Besides grouping costs by type, at most of the undertakings they use the allocation methods by place of occurring of cost and cost bearer. The differentiation by cost centres and cost bearers entails the differentiation of costs by composition as well. Cost allocation based only on cost type is a rare exception. Cost allocation only based on quantity was mentioned by 21% of the undertakings as a method, irrelevant from financial accounting's point of view.

Table 2. Setting up the cost centres and the cost bearers according to the number and ratio of 'yes' answers

Cost centres, cost units	Frequency	%
Maintenance unit	60	91
Supplementary unit	62	94
Overhead cost of main activity	63	96
Overhead costs of other activities	36	55
Overhead costs of central management	62	94
Sales costs	48	73
Deferred, other overhead costs	32	49
Cultivation, horticulture	64	97
Animal husbandry	53	80
Silviculture	24	36
Agricultural secondary activity	52	79
Agricultural service	45	68
Other cost centres, cost bearers	0	0

Source: Author's calculations

The main cost centres and cost bearers with their special nature of agricultural activities appear in the chart of accounts of the majority of undertakings. There are maintenance units at 91% of the companies, mainly machine units. Main representatives of supplementary units are the tractor units (N=60), combine units (N=57), heavy machinery (N=55), drying units (N=57), and lorry units (N=44). Irrigation units were mentioned by 35%, while draught animals were mentioned by 6% as a separate cost centre.

Contrary to the suggestions of professional literature, heavy machinery can be regarded as a single cost centre in itself. Heavy machinery separation is not the same as the tractor-plant machinery separation. Tractors include heavy machinery and trailers for 2/3 of the companies, and also include caravans for 5%.

Companies handlings plant costs separately use the following performance indicators:

- tractor unit: normal ha 60%, operation hours, machine performance 33%,
- lorry unit: operation hours 57%, tons km 27%,
- combine unit: normal ha 42%, harvester ha 33%, operation hours, machine performance 19%,
- irrigation unit: used water 96%,
- draught stock unit: horse using days 75%,
- drying unit: dried water weight 35%, dried plant weight 33%, operation hours 27%,
- heavy machinery unit: natural indicator 44%, normal ha 29%, operation hours, machine performance 22%.

The defining groups of overhead costs are those of the main activity and those of the central management. Categorising the overhead costs of the main activity is mainly completed by sector/sector group/main sector group (N=53), detailing by the cost functions was common to only 4/10 of the companies (N=26). (Cost grouping according to main sectors might be as follows: field plants growing, horticulture, fruit farming. The overhead costs of cultivation sectors can be divided by cost functions as follows: material handling and storage related to plant growing and horticulture, the operational costs of the buildings and machinery for the above mentioned, and the salary and additional costs for technical and administrational staff.)

Of the companies, 86% collect data separately for the overhead costs of cultivation, and 74% of them collect data separately for overhead costs of animal husbandry. For both main sectors it is typical to use cost based, specifically the direct cost based allocation. Of the companies showing overhead costs of cultivation, 40% separately chose direct costs as base of cost allocation, 14% chose material free direct costs, and 33% chose area as the base for cost allocation. In the case of animal breeding as the main activity sector the usual bases are the direct cost (45%), the material free cost (18%) and the number of the animals (14%).

An increase in company size and complexity justifies the more detailed collection of costs. It is true that companies divide their costs not only by main sectors and central management costs, but other overhead costs as well are usually high; however, the size and the number of main cost centres do not correspond.

In the case of cost bearers there are two main principles. First, the main products are the main cost bearers, while the secondary products are not usually cost bearers. For accounting questing of cultivation coming up due to the difference of growing cycles and the calendar year, the companies respond not by using a different business year definition, but by differentiating between the current and next year's growing cycles' costs.

On the other hand, the character of the agricultural activity and the structure of sales (production) − except for agricultural services − obviously influence the structure of the cost bearers. If the company had revenues from selling agricultural produces in the relevant period, then that produce group was presented among the cost bearers.

The differentiation of cost bearers does not mean that the certain product has been made by the company, or if it was, it does not mean that the company is selling it. For example, 7.7% of the companies showing animal husbandry as a cost bearer did not have revenues from it. This ratio is 73.9% in the case of silviculture, and for agricultural secondary activity it is 56.9%. For animal breeding, the secondary activity and forest management the resource usage and the cost accounting can be for different time periods from the sale and the revenue. This time difference partially explains the existence of the gap emerging between cost groups and the missing revenue. In my opinion it cannot be excluded that the companies list cost bearers for which they cannot add economic activities.

Table 3. Frequency of unit cost calculation regulation according to the conditions of the Accounting Act

Definition		Prepares unit cost calculation regulations?		Total
		yes	no	
Corrected revenue over 1.000 million HUF?	yes	8	0	8
	no	52	5	57
Total		60	5	65
Cost according to cost types over 500 million HUF?	yes	31	0	31
	no	24	4	28
Total		55	4	59

Source: Author's calculations

Over 90% of the agricultural companies prepare unit cost calculation regulations, despite the fact that only half of the businesses are obliged to do so by law. The main methods of defining the inventory value of their own produced stock is reversed calculation.

The agricultural businesses use the certain costs and cost groupings in the percentages shown below when preparing the calculation scheme:

- costs by cost types 91%,
- costs by cost centres 86%,
- value of own produced stock used 88%,
- value of secondary product 68%,
- amount of damage to plants 46%.

According to the questionnaire results, the general construction of the calculation scheme is in line with the suggestions of professional literature, except for the secondary product and the amount of damage to plants.

Table 4. Methods of defining the value of secondary product according to the number and rate of 'yes' answers

Methods	Frequency	%
Settlement price	51	77
Direct cost	8	12
Market price	7	11
In ratio of the internal index	3	5
In ratio of the market price	1	2

Source: Author's calculations

Despite several theories for valuation of secondary products, the agricultural companies treat this in a simple, single handed way. The theory and practice of calculation of secondary product values are influenced by the atmosphere of regulations of the Finance Ministry related to unit cost calculations, even in the era of legislative accounting. For the secondary product evaluation the main technique is using the settlement price (set price), which is used mainly for the evaluation of straw, manure and refuse grain. About 10% of the companies evaluate the secondary product by a separate calculation or by the market price.

The slim theoretical background does not provide much background for defining the value of damage of non-harvested plants. What we know from it is that the amount due to damage has to be treated as a direct cost decrease, but we are given no answer as to how.

The lack of a methodical guide can be seen in the structure of the calculation model, as well as in the defining of the value of loss. In the case of stock loss, 70% of the companies define the loss of plant producing based on the costs emerging in the area of loss, and up to the time of event. Further, 75% of the companies define their loss in case of revenue loss by multiplying the produce loss and the costs for 1 unit of produce (the amount of the actual produce and the loss defined in the minutes about loss) emerging up till the time of damage.

The calculation of living weight unit cost also mirrors the theory for agricultural companies. If the approach of the professional literature for defining living weight is unanimous, that entails that the practices of the companies will be too. The data show that 96% of the companies using living weight cost unit calculation derive their opening balance from the closing balance of the previous year, which is by equalling the closing and opening balance; 98% of the companies define the values of living stock by their actual inventory cost, their ageing by the cost unit of the age group, and the value of stock and weight increasing by taking the direct costs into consideration. As the cost unit of living stock weight, 98% of the companies define it as the ratio of the value of living weight and its quantity.

In the case when agricultural accounting theory offers no solution in evaluating a situation, or offers contradictory alternatives, the everyday practices bring several solutions to the surface. It is not surprising that for the evaluation of animals for breeding – stating that the value of the animals is their net value – the ratio of the 'yes' answers is not the usual 96-98%, but only 64%.

THE DEVELOPMENT OPPORTUNITIES OF COST ACCOUNTING AND UNIT COST CALCULATION SYSTEMS

Kaplan and Cooper (2001) distinguish four levels of costing systems. According to their opinion, most companies have second-level systems, which revolve around financial reports. The system is in line with the financial reporting criteria, can be used for stock evaluation, profit calculation and report preparation. It involves collecting costs by responsibility units, production, assembly, maintenance or other, production activity supporting cost centres. However, only the production costs are divided for the product, usually based on the direct labour, material or machine hours. Second-level systems attribute costs to cost centres, not to activities or processes, thus these systems:

- show distorted product costs,
- do not take into account the special features and consequences of the series production or product variations,
- show incorrect resource values used by activities, products and customers,
- are inappropriate for tracking profitability of activities, products and customers.

Besides this, the system is said to be inappropriate due to the lack of actuality of reports and feedback, as well as the overwhelm of financial indicators. Second-level systems publish feedback in line with financial reporting periods in over- summarised forms, focusing too much on financial indicators. Reports are made during mid-year and year, and close off tasks might be delayed for days, weeks and months, increasing the probability that the measure for the problems brought to daylight by the report would be too late. For this reason, data provided by second-level systems are not appropriate, not up to date, and they can only be used for management information in a limited way.

Regarding the results of the questionnaire presented in the previous chapter, based on Kaplan and Cooper's definition we can state that the cost accounting and unit cost calculation practices of Hungarian agricultural companies are identical to the features of second.level cost systems in many details. The collection of costs is done by cost centres, the allocation of the costs is usually by direct labour (eg: maintenance - operation hours) or machinery performance (eg: tractor – normal ha, operation hours; harverster - normal ha, operation hours). Despite the fact that 61% of the companies define the costs of activities, work phases and processes by grouping and allocating costs, there is no direct contact between costs and activities.

The majority of the responding companies (92%) define the most important task of unit cost calculation as the evaluation of their own produced products. Based on the ratio of the 'yes' answers, the second most important task of unit cost calculation is setting up the calculation price (88%).

Table 5. Usage of unit cost data according to the number and ratio of 'yes' answers

Definition	Frequency	%
Pricing decisions	35	53
Transfer price preparing	58	88
Evaluation of own produced products	61	92
Planning and examining unit cost	53	80
Measuring internal performance	34	52
Control of productivity	54	82
Decision-making	50	76
Other	1	2

Source: Author's calculations

Unit cost calculation mainly provides data for financial accounting, and through this for reporting. The other important area of using these data is preparing for decision making, the data usage for management purposes. According to the responses around 80% of the companies use the unit cost data for planning, examining and decision-making. Price setting and measuring of internal performance cannot be defined as important areas, compared to the others.

Kaplan and Cooper mention inappropriate and not relevant data provision as typical of second-level cost systems. In the third part of the questionnaire I mapped the assessment of cost allocating and unit cost calculation. The first question of the third part was aimed at how important the companies evaluate the different factors to be during the operation of their cost accounting and unit cost calculation systems. The answers were marked on a five-level scale (1: not important at all, 5: very important).

Table 6. The importance of certain factors when operating a cost accounting, unit cost calculation system

Factor	Number of answers	Average	Standard deviation	Coefficient of variation
Reliable data providing	65	4.78	0.45	9%
Unambiguous data providing	63	4.60	0.66	14%
Data useful for decision making	62	4.55	0.65	14%
Simple operation	61	3.93	1.00	25%
Timely data providing	64	3.86	0.92	24%
Cheap operation	61	3.85	1.08	28%
Quick data providing	65	3.83	0.98	26%

Source: Author's calculations

The factors can be divided into two groups. Companies consider reliable, unambiguous, and useful data providing. Simple and cheap data providing were also ranked important, as well as timely and quick data providing. For this category, though, a much higher standard deviation is associated; companies do not rate them as highly as the elements of the very important category.

Examining the strength and direction of the connection of the factors, the conclusions are:

- the connection between quick and timely data providing is very strong and positive,
- the connection between the simple and cheap operation of the system is stronger than average and positive,
- there are also positive and average strength connections between quick data providing and simple operation, quick data providing and cheap operation, and timely data providing and simple operation.

In the second point of the third part of the questionnaire I asked the companies to mark their own current cost system on a 1-5 scale (1: not satisfied at all, 5: very satisfied).

Table 7. Assessment of cost accounting, unit cost calculation systems

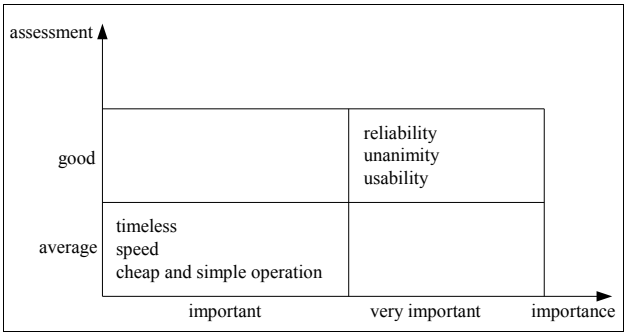
Factor	Number of answers	Average	Standard deviation	Coefficient of variation
Reliable data providing	64	4.39	0.61	14%
Data useful for decision making	62	4.34	0.77	18%
Unambiguous data providing	61	4.25	0.77	18%
Simple operation	61	3.62	1.00	28%
Cheap operation	59	3.59	1.02	28%
Timely data providing	61	3.23	1.07	33%
Quick data providing	62	3.21	1.18	37%

Source: Author's calculations

Here for assessing the system we used the same categories as for the importance of factors. We can put the reliability, unambiguous data and usability into the good category, and simplicity, cheapness, timeliness and speed into the average category. According to the self assessment of the responders this cost system is accurate and useful, but not fast or timely; however, these last two features are not as important as the first two.

Correlation calculations shows a relationship between speed, timeliness, cheap and simple operation, as well as stronger than average connections between reliability and usability and between unambiguous and useful data providing.

Examining together the importance and the system self assessment, two clearly distinctable segments are displayed. Companies considering reliability, unambiguous and useful data very important marked these factors for their own companies as good ones. The rest of the factors were considered important and average. By defining the correlation between the importance of a certain factor and its assessment we get usually a positive direction, average strong connection. The strongest connection is between the assessment of timeliness and speed.



Source: Author's calculations

Figure 1. The matrix of cost systems' importance and assessment

In the last point of the third part of the questionnaire I examined what modifications the companies are planning regarding their own current cost accounting and unit cost calculation systems.

Table 8. Modifications of the current cost accounting and unit cost calculation systems according to the number and ratio of 'yes' answers

Definition	Frequency	%
Setting up cost accounts	5	8
Contents of the cost accounts	7	11
Allocation of costs, bases/ratios	8	12
Evaluating secondary products	7	11
Reliability of data provided	24	36
Speed of data providing	27	41
Simplification of data providing	29	44
Usability of data provided	30	46
Defining coverage amount(s)	11	17
Introducing new cost calculation procedure	4	6
Other	0	0

Source: Author's calculations

The agricultural companies are basically satisfied with their own current cost systems, and what they would modify include the simplification and speeding up of data providing, and increasing its usability and reliability. These changes they want to carry out in their current systems. The structure and the contents of cost accounts and also the allocation of costs previously showed are not to be touched; they are 'sacred cows'. Companies rigidly insist on keeping their current cost calculation techniques, and do not plan to introduce new procedures. The contradiction of avoiding introducing activity based costing might be based on the lack of theoretical knowledge of methods, knowing that they are already using its basis when 61% of them define the cost of their main activities.

Although statistically there is no significant connection between the intention to modify and the assessment of the

cost system, still there is a stronger than usual connection in variance in the below cases:

- contents of cost accounts – unanimity,
- contents of cost accounts – usability,
- allocation of costs, base/ratio – reliability,
- allocation of costs, base/ratio – unanimity,
- allocation of costs, base/ratio – usability,
- reliability of data provided – usability,
- implementation new cost calculation procedure – reliability,
- implementation new cost calculation procedure – unanimity,
- implementation new cost calculation procedure – usability.

The 'sacred cows' are untouchable; however, if the unanimity, reliability and usability of the data provided can be increased, then the farmers will think about changing the 'sacred cows' as well, that is they would introduce a new cost calculation procedure, changing the contents of the cost accounts, using new bases and ratios for allocation.

The third-level systems of Kaplan & Cooper (2001) are capable of defining the accurate costs of activities, processes, products and customers, as well as providing data, including financial and non-financial information, that helps operative and research supporting development. Third/level systems can be set up without a new IT background, since the financial system and other information systems of the company already include those data that are needed (for an activity based costing system and operative feedback system).

Table 9. Data content of detailed records according to the number and ratio of 'yes' answers

Can detailed records can show…	Frequency	%
… the cost of the certain plots?	49	74
… the quantity of the activities completed on certain plots?	56	85
… the time requirement of the activities completed on certain plots?	27	41
… the return of certain plots?	56	85
… the cost of certain heavy machinery?	36	55
… the performance of certain heavy machinery?	42	64

Source: Author's calculations

It was proved by the responses of the agricultural companies to the questionnaire that the revenues and the quantity of the work phases completed on the plot can be defined from their detailed databases. If the costs of the plot can be established from the company's database, then the revenues and the quantity of the work phases completed on the plot can be established as well. The majority of companies have detailed databases on the costs and performance of heavy machinery. Companies recording the performance of their heavy machinery will more than likely have a detailed database about the costs of machinery, the work phases completed and the revenues from the plot as well. Recording the time demand of work phases is not significant among the companies.

Agricultural companies can set up third/level cost systems by using their current records, with insignificant extra effort, and they can elaborate techniques that are able to define the process focused unit cost of agricultural products while keeping in line with the stock value stipulations of the Accounting Act.

CONCLUSION

Hungarian agricultural companies consider the evaluation of their own produced stock as the most important task of unit cost calculation. For this result they collect cost data per cost type, cost centre and cost bearer. A cost centre can be the maintenance unit, the supporting unit (usually the tractor unit, combine unit, heavy machinery unit, drying unit and the lorry unit), and the overhead costs of main sectors. The detailing of the overhead costs of main sectors mainly happens according to sector/sector group/main sector group. Allocation of the maintenance and supporting operation is according to performance. The unit cost of the main product is done by post calculation, while for secondary product evaluation the main factor is the dictated price. They consider reliable, unambiguous and useful data very important, and according to their own self assessment their current cost systems satisfactorily fulfill these criteria. Timely and quick data providing, also cheap and simple operation are of secondary importance. They reject amending the structure and contents of the cost accounts, or changing the allocation bases/ratios. They are satisfied overall with their current cost accounting and unit cost calculation systems, and only half of the companies intend to simplify and speed up data providing, while one-third plan to increase the usefulness and reliability of the provided data. They are least negative when the change helps to improve usefulness, reliability and unambiguousness. In a statistically not significant ratio they show willingness for implementing new cost systems and changing the contents of the cost accounts and the allocation bases.

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