

## AGRICULTURAL COST ACCOUNTING – KEY ELEMENTS

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**Abstract:** Since agricultural sector interferes with energetically one, using the same production facilities, the importance of first one is continuously growing. Despite this fact, the studies had shown a need of bigger efforts on agricultural cost accounting research, especially on developing countries, for small and micro-enterprises. The purpose of this paper is to develop a set of key elements on agricultural cost accounting, in order to bring calculation methodology at the same level with technological development and interest for this sector. The study is based on literature review and the experience of agricultural Romanian companies.

**Key words:** agricultural cost accounting, crops cost accounting, accounting key elements, agricultural Romanian companies

## INTRODUCTION

On the last years, importance of the agricultural sector and especially crops cultivation has constantly increased. If we look at the main crops price evolution from 2007 until present we observe an important increasing trend (Table 1). We put this increase on the hand of the interferences between agricultural sector and the energetically one, especially on the fact that technical crops are occupying more and more production capacity, respectively land surface.

**Table 1**  
**2007 – 2013 crop price evolution on main Romanian markets**

PRODUSUL	2007	2008	2009	2010	2011	January 2013*
Wheat	0,61	0,66	0,47	0,59	0,88	1,05
Barley	0,59	0,67	0,44	0,41	0,91	1,07
Corn	0,55	0,72	0,48	0,57	1,00	1.02

Source: Romanian Annual Statistical Report 2010 tab 10.5, 2011 tab 10.6

\* Crops prices on main Romanian markets, available at <http://www.madr.ro/ro/prețul-cerealelor-pe-pietele-reprezentative-din-romania.html>

Anyway, on the last year Romanian crop cultivation sector has experienced a major technical development, mainly influenced by the investment projects financed through grants. The aid for Romanian agricultural sector was huge, 4,8 billion euro between 2008 and March 2013 period accordingly the 14.March.2013 report of Agenția de Plăți pentru Dezvoltare Rurală și Pescuit. This massive investment brings new machines which replaces the old ones and a lot of the manual work.

On the other hand, Integrated Management Systems (IMS) is more and more popular between Romanian companies. The main advantages of the IMSs are given by providing real time information's and an integrated approach over the business.

Anyway, despite this facts the research on agricultural cost accounting is needs more attention (Hopper et all, 2009; Dumitru et all, 2011). Also, the researchers seem to

give less attention on management accounting, especially on agricultural cost accounting, despite the growing importance of this business sector.

## MATERIALS AND METHODS

Regarding the main scope of research, theories in a social sciences field such as management accounting research should provide explanations that are useful for those we study managers, organizations and society (Malmi & Granlund, 2009). The ultimate reason for developing a theory is to be able to use this understanding, or theory, in creating better management accounting practices, both in terms of content and use (Chenhall, 2003; Ittner & Larcker, 2001). Also, an important criterion for a theory's success is the value of the theory for users. The main scope of this paper is to provide a set of key elements needed for cost accounting and control in crop cultivation businesses.

In order to gain an in-depth understanding of crops cost accounting key elements and to observe how managers are protecting their interests using cost accounting and control tools we have used a qualitative approach is adopted for this investigation. The qualitative approach generates a spectrum of responses that help to document some of the best practices that yielded good results, allowing the broader segment to emulate the same. Also, for the present study, a multiple case study field research design was selected a set of 8 semi-structured interviews with management accountants/managers of Romanian agricultural firms. In order to develop a set of key elements for crops cost accounting, a literature review was also necessary.

## RESULTS AND DISCUSSIONS

The findings of the research are presented as follows:

**a) The cost objects issue.** Setting cost objects is a key element in cost accounting effort (Horngreen et al, 2011, p:30). A cost object is defined as “anything for which a cost is computed” (Kaplan et al, 2012, p:125; Horngreen et al, 2011, p:27). Usually, a cost object is established in accordance with sales unit of measurement. We say that most simple cost object is the smallest part from a good, which can be written on the invoice, according with **causality principle** (IMA, p: 28-31). Anyway, crops production, on a given scenario, depends on much more other factors than costs. For example, grain production is mainly influenced by the weather along the year, among other factors, like the amount of cost per unit of land. Also, crops cultivation is, more, an exception from this management accounting principle.

On this issue, the solution is a) until harvesting (including grain transport from the field) to use as cost object the unit of land (hectares, as example) instead of production quantitative indicators (as kg of production). In order to calculate cost/quantity we proceed to report the amount of costs/unit of land at the quantity produced on that unit of land. The most frequent cost object meet on practice was the “farm”, which comprise the entire surface of land which is cultivated with a specifically crop type and b) after harvesting is recommended to be used as cost object quantity of goods, usually in according with selling unit of measurement.

**b) Cost assignment.** Once the cost object has been defined, cost assignment should be simple. Also, concerning accumulating direct costs over cultivation land, described above as “farm”, and allocating indirect costs can be made as is shown below:

- **Material costs**, including seeds, herbicides, fungicides and other materials used until crops harvesting are direct costs in relation with the cost objects described above. Materials can be stored before consumption, or consummated right after acquisition without storage. Also, in the case which materials are stored, cost of the storage can be regarded as an overhead cost and treated as one.

- **Cost of mechanical works**, including a) depreciation of the machines, fuel consumption and direct personnel costs and b) cost of mechanical works if this are outsourced. In case a), can be treated as a direct cost if is used cost per machine-hour method. This method is described in detail by Pelin A. (Pelin, A., 2009, p: 35). In case b), is more simple to assign cost of mechanical works, because cost per land unit is already computed.

- **Other direct costs**. Indirect costs include authentically and non-authentically indirect costs. Authentically indirect costs are ones which cannot be identified on cost object and non-authentically costs are direct costs which are not feasible to computed so (Horngren et al., 2011, p: 29). For example, crops insurance costs are usually direct ones, but in some situations are considered indirect. Anyway, for a most accurate cost calculation is a need to treat as much as possible al direct cost as such.

- **Overheads costs** are including all production costs, but excluding direct costs described above. In this case allocation of production overhead costs to cost objects is mainly made on the basis of machine hours used, in case which company has own machinery in order to accomplish mechanical works. Otherwise, can be used as cost driver the amount of cost for mechanical works as allocation key. Other cost allocation keys can be used as cost-allocation base, but this is most relevant one in crop production activity.

c) **Real time cost control**. As earlier was noted, in the last 5 years, infusion with technical capital on agricultural field was significant. This has raised a new potential concerning cost accounting, respectively the possibility to exercise a real time cost control over the production costs. New technologies allow managers to track in real time all consumptions trough satellite monitoring systems which are equipping new machines. For example, John Deere Autosteering system is an autopilot driving system for John Deere machines, reducing fuel consumption needed for technical works, minimum materials waste during the works and data storage concerning material consumption. Exist other similar systems helping to monitor consumptions of materials and to trace the locations and working hours for agricultural machines.

Anyway, an IMS helps managers to plan and to calculate and control costs in real time. But if the tracking systems are integrated on IMS, that will be the state of the art for agricultural cost accounting and control.

## CONCLUSIONS

Literature does not provide convincing evidence of the practical significance of management accounting in the context of technical development on agricultural sector, and less in providing way to take advantage of opportunities.

We expect like this paper to fulfill the gaps of managers from agricultural companies regarding cost accounting for crop cultivation trough the findings of the case studies developed in this research efforts. The results of the study are a set of key elements for a crop production successful cost accounting system, respectively: establishing cost objects, cost assignment and real time cost control. These results have to be considered in

the light of the limitations of the present study. Our research is subject to the general restrictions of a multiple case study research design.

The importance of the agricultural domain is huge, and as consequence, development in agricultural cost accounting should be at same level with his importance. Anyway, seems like technical development in crop cultivation domain is a step forward comparing with cost accounting research in the same domain.

Trough this paper is opening a door for further research, which can be made with the aim to complete a feasible model of cost management for agricultural companies, including cost management advanced practices for crop cultivation and a performing agricultural cost control model.

## REFERENCES

1. **CHENHALL, R.H.**, 2003, Management control system design within its organizational context: Findings from contingency-based research and directions for the future, *Accounting, Organizations and Society*, vol. 28, no. 2-3, pp 127-168
2. **DUMITRU, MĂDĂLINA, CALU, DANIELA ARTEMISA, GORGAN, CĂTĂLINA, CALU, ADRIANA**, 2011, A historical approach of change in management accounting topics published in Romania, *Accounting and Management Information Systems*, Vol. 10, No. 3, pp. 375–396
3. **HOPPER, T.**, 2009, Management accounting in less developed countries: what is known and needs knowing, *Accounting, Auditing & Accountability Journal*, Vol. 22 No. 3, pp: 469-514
4. **HORNGREN, C., DATAR, S.M. RAJAN, M.V.**, 2011, *Cost accounting – A Managerial Emphasis*, 14TH Ed., New Jersey: Pearson Education, pp: 27-30
5. **INSTITUTE OF MANAGEMENT ACCOUNTANTS**, 2012, Conceptual Framework for Managerial Costing, pp: 28-31, available online at [www.imanet.org/PDFs/Public/Research/CFMC Draft for Review.pdf](http://www.imanet.org/PDFs/Public/Research/CFMC Draft for Review.pdf)
6. **ITTNER, C.D., LARCKER, D.F.**, 2001, Assessing empirical research in managerial accounting: A value-based management perspective, *Journal of Accounting and Economics*, vol. 32, no 1-3, pp: 349-410
7. **KAPLAN, R.S., ATKINSON, A.A., MATSUMURA, ELA MAE, YOUNG, M.S.**, 2012 *Management Accounting: Information for Decision-Making and Strategy Execution*, 6TH Ed. New Jersey: Pearson Education, pp:
8. **MALMI, T., GRANLUND, M.**, 2009, In Search of Management Accounting Theory, *European Accounting Review*, vol.18, no. 3, pp: 597- 620
9. \*\*\* - [www.apdrp.ro](http://www.apdrp.ro)
10. \*\*\* - [www.insse.ro](http://www.insse.ro)
11. \*\*\* - [www.madr.ro](http://www.madr.ro)