

## THE ACCOUNTING TREATMENT OF THE BIOLOGICAL PROCESS OF TRANSFORMATION

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**Abstract:** Agriculture is a specific economic activity because its mode of production remained at a lower level in comparison to other industrial companies. Of course, this mainly relates to small agricultural enterprises but to some extent it is also the case with the highly developed agricultural economies, because the process of production may not be the same as in other economic activities. In essence, these differences between agriculture and other economic activities can be clearly seen in accounting records. Through various estimations and calculations as well as through other accounting methods we recognize a little more specific type of recording and use some accounts that are not present in other economic activities. The key difference is found in the strong agricultural subsidies as a powerful instrument for the further development and modernization of agriculture. It should be noted that since its foundation the European Union has directed its budget, as well as the majority of incomes, to agriculture. The main intention of this study is to explore biological process of transformation, which leads to qualitative and quantitative changes in the biological asset - process of growth, quality changes, production and reproduction, each of which can be measured. We will also indicate their economic benefit – how changes in the value of biological assets affect the important income and expenses entries. For a detailed analysis of the problem, we examine the concept and the accounting records of biological transformation process. We also analyze the effects of applying the fair value as an asset evaluating method and the effects of fair evaluation on the balance statements of agricultural enterprises. In addition, the application of accounting methods by which the biological growth is recognized and measured by using the current fair value in relation to the historical cost accounting method is also discussed. The importance of this approach is reflected in the fact that when the biological growth is recognized and measured using the current fair value, the changes in fair value are recorded throughout the whole period, for instance, from planting a tree to its cutting. This method contributes to minimizing the risk of not reporting the income. By testing the research methods, we will use the combined research methods (relevant methodology). This relates primarily to the research through literature, accounting methods, historical methods and other relevant scientific methods (induction, synthesis).

**Key words:** agriculture, agricultural production, biological assets, accounting, balance, fair value, profit.

### INTRODUCTION

Agricultural production is defined by biological characteristics of plants and animal species and requires a longer period of time for transforming these means into the final value and this period can not be shortened. Optimal development achieved by the application of modern technical machinery and tools, implementation of strategy of rapid growth with the use of innovation and research can lead to a reduction in the time needed for the product transformation and therefore result in a faster turnover of assets and higher profits.

Biological assets should be measured at initial recognition and at the end of each reporting period by its fair value less costs to sell.

Agricultural products made from biological assets should be measured by fair value less costs to sell at the point of sale or at the time of harvest. Initial recognition of biological assets for which the market-determined prices are not available or the alternative estimates of

fair value are completely unreliable is valued by its purchase price – i.e. cost price less accumulated depreciation and estimated costs to sell. Determining the fair value of biological assets or agricultural products may be facilitated by grouping biological assets and agricultural products according to significant characteristics, such as age and quality. The manufacturer selects the attributes that correspond to the attributes on the market as a basis for setting prices.

As a universal value of biological assets capital requires economic approach to justification of investments in agricultural processes. Producer makes decisions on the selection of capital investments in production, technology and innovation with the aim of obtaining competitive products. Financial expenditures on agricultural incentives provided by the Ministry and approved by the State Government are most important because they provide additional financing for agriculture leading to faster growth and increased yield in agriculture.

Biological assets - during the process of transformation from biological assets (forests, orchards, livestock) to agricultural products - is treated according to IAS 41 for accounting purposes. This standard regulates the accounting treatment of biological assets during the period of growth, decline and birth (fertilization) as well as the initial evaluation of agricultural products at the time of harvest, i.e. collection. Accounting treatment of further process of agricultural products is not the subject of this standard. A change in fair value of biological assets, less expenses to sell is included in net profit or net loss for the relevant period. This standard applies to agricultural products, i.e. the harvested product of biological assets only at the moment of harvesting. After this moment, i.e. after the processing of biological resources, the IAS 2 – Inventories – is used.

#### **Hypothesis, methodology and empirical data**

In the context of testing the primary hypothesis the subject of this work is that (H1) biological process of transformation leads to changes in the value of biological resources what causes the occurrence of changes in increase or decrease in important items of income and expenses. The main motive for the analysis of the problem is to examine thoroughly, by using accounting methods, the biological transformation process which leads to changes in the biological assets as well as to indicate its economic effect.

Another important research hypothesis (H2) is: The most effective method of recognition and measurement of biological growth in accounting is the current fair value method.

Owing to the literature and empirical research - especially in the case of agricultural enterprises operating in developing countries - and the application of relevant research methodologies these hypotheses have been confirmed.

These findings are of great importance for the practical application of the theoretical and methodological issues treated, i.e. for the quality of financial reports as a factor of the efficient management in the function of increasing efficiency and effectiveness of agricultural enterprises.

## **2. THE CONCEPT AND THE ACCOUNTING RECORDS OF THE BIOLOGICAL TRANSFORMATION PROCESS**

Biological transformation results in different types of physical change - growth, character changes, production and reproduction - and each of them can be observed and measured. A change in the biological asset value due to harvesting is also a physical change. Agricultural activity is often exposed to climate, disease and other natural risks. If an event leading to income or expenditure occurs, the nature and the amount of that event are revealed in accordance with the financial report.

The biological transformation leads to the following results:

- Changes in the value of assets through,
- Increase (increase in quantity or improvement of quality of an animals or plants),
- Decrease (reduction or deterioration in quality of animals or plants),
- Creation/procreation (procreation/creation of new animals/plants), and
- Production of agricultural products such as latex, tea leaves, wool and milk.

**Example 1:** An example of accounting evidence of biological growth for its own production Company “A” whose main activity is production of table grapes had a yield of 30,000kg with net selling price of 1euro/kg. The grapes will be used for the homemade wine production – inventories not intended for resale.

*Table 1*

No.	Date	Description	Account	Debit	Credit
1)		Material in the warehouse Vineyard Quantity of grapes harvested	1001 0251	30.000	30.000

Company "A", whose main activity is homemade table wine production, will apply IAS 41 - Agriculture for the evaluation of the vineyard (as a perennial plant) and the grapes at the vintage time. In accounting, inventory of grapes in the warehouse, before the wine production starts, is an inventory of materials. If the stocks of grapes are to be used for further processing - production of wine, then the collected stocks are considered as a material inventory and, on the other hand, if the collected supplies were intended for sale (and would not be the subject for further processing), then the grapes are classified as inventories of goods. IAS 41 requires that inventories of agricultural products at the time of their collection are valued by the fair value less estimated costs to sell. In this case it usually means by multiplying the quantity of collected grapes by its net selling price (the net selling price is nothing more than the price formed on the active market less, in this case, the estimated costs to sell per unit - kilogram of grapes. Thus, the grapes before vintage, i.e. while on vine plants, are an integral part of the vineyard as a biological asset. If we assume that the balance sheet is dated between the start of the biological cycle of production and the vintage, the entire value of the vineyard, along with grapes, will be evaluated by its fair value less estimated costs to sell. Of course, the value of vineyards just before the vintage must naturally be higher than its value after the vintage. And such reduction of value will be recorded with the above mentioned accounting item. The inventory value of grapes can also be calculated by dividing the sum of annual amount of depreciation of vineyards (evaluated at fair value less estimated costs to sell) and the expenses of obtaining the supplies of grapes (for instance, payments to the grape collectors, transportation costs etc.).

**Example 2: An example of evidence of biological growth intended for resale**

A company is registered for growing raspberries and owns raspberry plants. It should record 1,000 kg of picked raspberries with the market value – less estimated costs to sell - of 5,000KM. Raspberries are intended to be sold to another company that processes fruits and vegetables.

In accounting, raspberries picked for a company on its own raspberry plantings represent stocks of finished products that can be formed gradually (if the process of picking raspberries is to be considered a production activity) or directly.

The first option presumes such organization of accounting which would enable the production process – vintage to be recorded gradually through class 9, in the way that all the elements of costs (wages of workers engaged in vintage, fuel costs, and depreciation of certain

equipment used at vintage, depreciation of raspberry plants, etc.) are gradually included in the cost. This means that the inventory of unfinished production (raspberry vintage stage) is treated with the International Accounting Standard No.2, which would probably result with the occurrence of a difference at the moment of initial recognition of agricultural products between their cost and the market value less costs to sell. In another variant, this difference would objectively not appear.

Table 2.

No.	Date	Description	Account	Debit	Credit
2)		Finished products	120	5.000	
		Changes in inventories	63		x
		Revenue from activated inventories For recording picked raspberries	62		x
2a)		Finished products	120	5.000	
		Other perennial plantings	0253		5.000
		For recording picked raspberries			

In the example that covers only one accounting phase in tracking stocks of agricultural products, it is not possible to determine the amount by which a group of accounts 62 or 63 (especially the group 63, due to specific nature of financial accounting and plant ledger) should be credited. In any case, the amount on the credit side of accounts in the group 62 should correspond to the positive difference between the estimated market value less costs to sell and the cost of production of raspberries.

**Example 3:** Fair valuation of biological growth in the case of an organized plant ledger Company "Ribarstvo AD" takes out 10,000 kg of fish from its ponds. The estimated fair value of the fish with the estimated costs to sell is 60,000 KM. The company's cost of breeding - fattening is recorded in the plant ledger. According to the accounting data the cost of fish is 50,000 KM.

Table 3.

No.	Date	Description	Account	Debit	Credit
3)		Finished products	120	10.000	
		Revenue from products activated	6210		10.000
		For the activation of agricultural products			

### 3. FAIR VALUE AS A CONCEPT OF ASSET VALUATION

Determining the fair value of biological assets or agricultural products may be facilitated by grouping them according to significant attributes such as age and quality. As a basis for pricing strategies, an enterprise selects the attributes that correspond to the attributes used in the market.

Companies often make contracts for selling their biological assets or agricultural products at a future date. Contract prices are not necessarily relevant in determining the fair value, because the fair value reflects the current conditions in the market in which a willing buyer and a willing seller would make a transaction.

Accordingly, the fair value of biological assets or agricultural products is not adjusted just because of the existence of the contract. In some cases, the contract for the sale of a biological asset or agricultural product may be harmful (onerous), due to required reserves, potential payables and potential assets covered by hazardous (onerous) contracts. If there is an active market of biological assets or agricultural products with a known present location and

condition, the price quoted in that market is an appropriate basis for determining the fair value of the asset.

If an entity has access to different active markets, the entity will use the most active market. For instance, if an entity has access to two active markets, it will use prices from the market it planned to access. If no active market exists, the entity will use one or, when possible, more of the following alternatives in determining the fair value of its products:

1. The last transaction price, provided that there were no significant changes of that transaction in a specified period;
2. The market prices for similar assets with adjustments for reflecting differences;
3. Sector benchmarks such as the value of an orchard expressed per crate, bushel (metric, wagon) or hectare, and the value of cattle expressed per kilogram of meat.

In some cases, information sources may suggest different conclusions about the fair value of biological assets or agricultural products. An entity considers the reasons for these differences, to come to the reliable estimates of fair value within a relatively narrow range of reasonable estimations.

#### **4. EFFECTS OF THE FAIR VALUATION ON THE BALANCE SHEETS OF AGRICULTURAL ENTERPRISES**

IAS 41 requires that the change in fair value of biological assets is included in net profit or loss for the period in which it occurred. In agricultural activities a change in physical characteristics of animals and plants directly results in an increase or a decrease in the economic benefits of an entity. According to the historical cost accounting method (purchase price) a wood company, for instance, could not report any income until the first fell and sale of wood, some thirty years after the trees are planted.

On the other hand, when a method by which biological growth is recognized and measured by using the current fair value is applied, the fair value changes are recorded during the entire period, from planting to the first timber harvesting and selling. When, however, we use an international method by which the biological growth is recognized and measured by using the current fair value, the fair value is recognized throughout the period, from planting trees until the felling. It can be easily concluded that in any case of a biological asset the fair valuation is a more appropriate method.

The profit or loss arising on initial recognition of biological assets at fair value less estimated costs to sell, as well as the profit or loss resulting from changes in fair value less estimated costs to sell of biological assets, will be included in profit or loss for the period in which they were created.

A loss may arise on initial recognition of biological assets while in determining the fair value of a biological asset we need to reduce sales price by the estimated costs to sell. The profit may arise on initial recognition of biological resources, for instance, when a calf is born or when the market value of the obtained assets is greater than the value of the works on the biological properties.

The objective of this standard is to prescribe the accounting treatment and disclosures related to agricultural activity. This standard is applied to the following accounts - when they are related to agricultural activity:

1. Biological resources;
2. Agricultural products at the time of harvest, and
3. State investments.

This standard does not apply to:

1. Land associated with the agricultural activity,
2. Intangible assets related to agricultural activity.

This standard applies to agricultural produce, i.e. the product of biological assets of entities, only at the time of its production. Thereafter, IAS 2 - Inventories or another applicable standard is used. Accordingly, this standard does not address the processing of agricultural products after their harvest, for example, a process of making grapes into wine by a vintner who has grown grapes. Although such processing may be a logical and natural extension of agricultural activities and events taking place may have some similarity to biological transformation, such processing is not included in the definition of agricultural activity given in this standard.

Table 4.

Biological assets	Agricultural produce	Products that result from a process after the harvest/yield
Sheep	Wool	Thread, carpet
Tree plantation	Felled trees	Logs, lumber
Plants	Cotton, sugar cane harvested	Thread, clothing sugar
Dairy cows	Milk	Cheese
Pigs	Pork carcass	Sausage, smoked ham
Shrubbery	Leaves	Tea, dried tobacco
Vine	Grapes	Wine
Fruit	Harvested fruit	Processed fruit

Biological transformation includes the process of growth, characteristic changes, production and reproduction that lead to qualitative and quantitative changes in the biological asset. Sales costs are incremental costs directly attributable to the disposal of assets, excluding financing costs and income taxes. A group of biological assets is an aggregation of similar living animals or plants.

Book value is the amount by which an asset is recognized in the statement of financial position. Fair value is the amount for which an asset could be exchanged or a liability settled between informed and willing parties in an independent transaction.

Government grants are defined in IAS 20 - Accounting for Government Grants and Disclosure of Government Assistance.

### CONCLUSION

Biological transformation results in different types of physical change - growth, characteristic changes, production, and procreation. Each of these types can be observed. The agricultural activities change the physical characteristics of living animals or plants by increasing or decreasing the economic benefits of a legal entity. A change in the value of a biological asset due to harvesting is also a physical change.

Biological transformation includes the process of growth, characteristic changes, production and reproduction that lead to qualitative and quantitative changes in the biological assets. Sales costs are incremental costs directly attributable to the disposal of assets, excluding financing costs and income taxes. A group of biological assets is an aggregation of similar living animals or plants.

Determining the fair value of biological assets or agricultural products may be facilitated by grouping biological assets or agricultural products according to significant attributes, for example by age or quality. As a basis for pricing, an entity selects the attributes corresponding to those used in the market. Contract prices are not necessarily relevant in determining fair value, because the fair value reflects the current market conditions in which a

transaction between a willing buyer and a seller would be made. Accordingly, the fair value of biological assets or agricultural products is not adjusted because of the existence of the contract.

IAS 41 - Agriculture provides, above all, the accounting treatment of so-called biological assets during the period of growth, decline and birth (fertilization) and the initial evaluation of agricultural products at the time of harvest, i.e. collection. Further processing of agricultural products is not the subject of this standard. After harvesting, IAS 2 – Inventories is applied. Accordingly, this standard does not address the processing of agricultural products after the harvest although such processing may be a logical and natural extension of agricultural activities and events taking place may have some similarity to biological transformation. In a purely accounting sense, the processing is to be treated as a production activity so the subject of processing - whether agricultural or other products - is quite unimportant.

IAS 41 requires valuation of biological assets at fair value less estimated costs to sell, from the initial recognition until the moment of harvesting, unless the fair value on initial recognition can not be reliably measured. That is the reason why this standard is based on the assumption that it is possible to reliably determine the fair value of a biological asset. Otherwise, this standard requires that a specific biological asset is measured at its cost - the cost price, net of accumulated depreciation and estimated costs to sell. Agricultural products at the time of collection should always be valued at their fair value less costs to sell.

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