CONSIDERATIONS REGARDING THE DEPRECIATION METHODS OF THE ASSETS USED IN AGRICULTURAL PRODUCTION

Ph.D. Student, Anda Ileana NECULA
"Valahia" University of Târgovişte, Romania
E-mail: anda_ileana@yahoo.com
Ph.D. Student, Isabela STANCU (LITA)
"Valahia" University of Târgovişte, Romania
E-mail: isabela.stanculita@yahoo.com
Associate Professor., Ph.D., Gabriel CUCUI
"Valahia" University of Târgovişte, Romania
E-mail: gabicucui@gmail.com
Ph.D. Student, Anca Daniela ŞENCHEA (FLOREA)
"Valahia" University of Târgovişte, Romania
E-mail: ancasenchea@yahoo.com

Abstract: *Romania owns an important granary area especially located, but not limited to the Danube meadow, in the Southern and South Eastern part of the country, which tends to be increasingly affected by the draught, in the larger context of climate changes. In addition, an important share of the Romanian population continues to live and work in rural areas, having the agriculture as the main occupation. In order to increase their performance and profitability, these agricultural exploitations need informational, logistical and technological investments, amid their adaption to the requirements of the European agricultural market, featured by market-oriented agricultural production structures. From the accounting point of view, choosing of the adequate method for the depreciation of the assets represent a topical point. This paper aims to review the depreciation methods used in order to ensure, via the costing mechanism, the recovery of the investments in the assets used in agriculture, and ensuring of the economic extension. The conclusions try to outline the strengths and the flaw points of every examined method, considering their adequacy for the agriculture domain.*

Keywords: *depreciation method, accounting, digressive coefficient, agriculture.*
JEL classification: *M41.*

1. Introduction

The role of agriculture within the Romanian economic context is widely emphasized in the literature (Andrei et al., 2017; Popescu et. al., 2009; Badea and Mieilă, 2008). This interest has been reinforced as result of the deployments in the last period, marked by the opportunities and challenges of climate changes, and the urgent shift towards the green economy. This veritable emergency implies outstanding efforts, aimed to ensure a "greener" production by computerization, smart farming, besides quasi-generalization to irrigation systems in the Romanian South area, through commissioning and reputing into operation of the existing irrigation systems, and by planting of forest curtains for water retention. The Romanian South area represents one of the outstanding granary areas in Europe, which is increasingly affected by the draught, which impose new solutions, in order to deal with the new conditions. Within this demarche, additional challenges arise from the fragmented character of the land properties, or as result of certain landscaping works which belong to certain individual owners (Ion and Andrei, 2014; Ciutacu et al., 2016; Popescu and Andrei, 2011), as the respective landscaping have to be properly recorded in the accounts.

By definition, the fixed assets represent the part of assets of whose operation duration exceeds one year, and a minimum purchase value of 2500 RON (Romanian New Leu) (according to the Romanian Tax Code, 2003, updated in 2014). Their main particularity is that they participate in several production cycles, through they keep unchanged their physical configuration, and gradually transmit their value towards the

goods and services of whose production they participate. (Cenar, Todea & Deaconu, 2003). From the scientific perspective, the depreciation express the modality the cost of non-current assets is transferred to the goods and services in the production of which they participate throughout the operating time of the former, and is recovered concomitant to their value diminution, as they accumulate physical and moral wear and tear (Todea, 2002).

The concept may incur difficulties especially in case of non-specialists, particularly because it represents a calculated expenditure. In order to facilitate the understanding and grasping of the concept, depreciation can be defined as the process of gradual recovery from both accounting and tax perspectives of all costs related to construction, purchase, assembly, production, improvement, installation or modernization of depreciable assets (Paliu-Popa, 2010).

Consequently, depreciation is the result of an accounting procedure of logical and systematic distribution of the cost of non-current assets, applied in a specific way as to charge part of this cost to each year which will benefit from the use of those non-current assets (Feleagă and Ionașcu, 1998).

In accounting, as in everyday life, all the revenues and expenditures are reported based on a certain period, and there is mandatory to measure the profit or loss for the respective time-range. With regards to the depreciation, there may be stated that it represents the fractional expenditures from the cost of depreciated assets, which are used throughout the specified accounting period.

In detail, there may be stated that the role of depreciation is to deduct that annual depreciable amount, calculated based on the total value of the asset over the total useful life. The role of calculating of depreciation expenditure is to preserve the resources of the company, in order to allow the latter in the process of the assets reconstitution, through the usage of the already existing assets.

According to the legislation in force, the depreciation registered according to the established rates is not subject to taxation. However, the additional depreciations, without the approval of the fiscal bodies, are considered profits and therefore are subject to taxation. Consequently, the depreciation represents the allocation of the depreciable amount of an asset through its operating period. (Romanian Tax Code, 2003).

Concerning this interpretation, there are various approaches in the literature, but the following three are of interest for the accounting purposes (Luta and Grigorescu, 2013):

- depreciation as a process of correction of the value of assets;
- depreciation as a process of transfer or distribution of the cost of assets towards the expenditures registered through the accounting year;
- depreciation as a source of financing the renewal of assets.

With regards to the accounting depreciation, the operating time-life is established within the company and is included accordingly the accounting policies. The accounting depreciation is calculated with respect to the operating period of the asset, that is, the time range that the asset is expected to produce economic benefits.

2. Depreciation methods

The depreciation methods based on which the depreciable amount is established annually, monthly, etc. are as follows:

- straight-line depreciation
- degressive depreciation
- accelerated depreciation

The recording of the depreciation in the financial accounting requires the distribution for each year of the amount calculated for the operating expenses by using the accounts:

- **6811** "Depreciation of non-current assets"
- **280** "Depreciation of intangible assets"
- **281** "Depreciation of tangible assets"

In order to exemplify the depreciation regime, the following example is considered:

On January 25th 2021, an entity purchased a machine in order to use it in its agricultural production activity. The entry book value is RON 50,000 plus VAT, which is depreciated during the operating period of 5 years.

The method for entering the purchase and depreciation of the machine in the accounts is the following:

%	=	**404** Suppliers of non-current assets	59500
2131 Plant and machinery)			50000
4426 Deductible VAT			9500

Entry of the invoice payment operation through the current account in the accounting records:

404	=	**5121**	59500
Suppliers of non-current assets		RON bank accounts	

The calculation formula according to which the monthly depreciation will be calculated is:

Monthly depreciation = Book value of asset/Economic lifetime/12 months = 50,000/5/12 = RON 833.3

Entry of the monthly accounting depreciation in the accounts:

6811	=	**2813**	833.3
Depreciation of non-current assets		Depreciation of plant and machinery, motor vehicles	

The annual straight-line depreciation (Ad) consists in the uniform allocation of the input book value over the entire normal operating period expressed in years and is calculated as follows:

- the depreciation rate (Dr) is determined

$$Dr = \frac{100}{OT} \cdot 100$$

- wherein OT represents the operating life of the asset.
- in order to determine the annual depreciation value, the depreciable amount of the asset, or the book enter value (Bv) is weighted by the depreciation rate:

$$D = Bv \cdot Dr$$

Exemple. The straight-line depreciation in case of a machine with a book value of RON 50,000 and operating period of 5 years. According to the above presented algorithm, it follows that:

1. depreciation rate $Dr = \frac{100}{5} \cdot 100 = 20\%$
2. annual depreciation: $Ad = 50000 \cdot 20\% = 10000$
3. monthly depreciation: $Md = \frac{D}{12} = 833.3$.

A variant of the straight-line depreciation is represented by the **depreciation calculated pro rata** to the volume of the activity being carried out. In this situation, the depreciation rate (Dr) is calculated upon:

$$Dr = \frac{Bv}{PA} \cdot 100,$$

in which, by PA, has been denoted the provisional activity volume of the considered fixed asset.

The value of the depreciation rate applies to the volume of activity performed in the period considered (usually the calendar month).

Table no. 1. Straight-line depreciation table

No. of years	Asset entry book value	Depreciation rate (*Dr*)	Annual depreciation	Accumulated depreciation	Net book value
1	50,000	20%	10,000	10,000	40,000
2	50,000	20%	10,000	20,000	30,000
3	50,000	20%	10,000	30,000	20,000
4	50,000	20%	10,000	40,000	10,000
5	50,000	20%	10,000	50,000	0
Total	x	x	50,000	-	-

Source: authors' processing.

The **straight-line depreciation** has the advantage that it is simple to apply, being the most frequently used due to the uniformity of expenses for the year and costs over time.

The **annual degressive depreciation** is calculated as follows:

- the depreciation rate is calculated according to the operating life (Dr);
- the degresive rate to be applied (Rd) is calculated by multiplying the depreciation rate (Dr) by a tax coefficient (K) which can have one of the following values:
  - 1.5 if the normal operating time is between 2 and 5 years;
  - 2.0 if the normal operating life is between 5 and 10 years;
  - 2.5 if the normal operational time exceeds 10 years;
- the degressive depreciation is calculated until the straight-line depreciation is greater than or equal to the degressive depreciation.

Also, the degressive depreciation can be calculated:

- either without consideing the impact of wear and tear (DD1);
- either by taking into account the wear and tear (DD2).

In case when the impact of wear and tear (DD1) is not considered, the annual depreciation is calculated by applying the rate (Rd):

- to the book enter value (Bv) in the first year;

- for the following years in the operating period, to the net book value (*NBv*) calculated as:

$$NBv = Bv - Accd$$

in which, by *Accd* , there has been denoted the accumulated depreciation.

Under these circumstances, based on the annual depreciation rate (*Dr*) equal to 20%, and considering that the machine is depreciable in 5 years, corresponding to a multiplicative tax coefficient (K) of 1.5, the degressive depreciation rate (*DDr*) follows that:

$$DDr = K \cdot Dr = 1.5 \cdot 20\% = 30\%.$$

The degressive depreciation table for the equipment in above considered example is presented in table no. 2.

Table no. 2. Degressive depreciation table

No. of years	Asset entry book value	*DDr*	Annual degressive depreciation	Accumulated degressive depreciation	Net book value
1	50,000	30%	15,000	15,000	35,000
2	35,000	30%	10,500	25,500	**24,500/3**
3	24,500	30%	8,166.66	33,666.6	16,333.4
4	24,500	30%	8,166.66	41,833.2	8,166.66
5	24,500	30%	8,166.66	50,000	0

Source: authors' processing.

The accelerated depreciation consists in including an annual depreciation of 50% of the book entry value of the fixed asset concerned, in the operating expenditures of the first operating year. The annual depreciations for the following financial years are calculated at the value remaining to be depreciated, according to the straight-line regime, by relating it to the number of remaining operational years. The use of the accelerated depreciation regime is approved by the Ministry of Public Finance, at the proposal of the General Meeting of shareholders or associates for trading companies or the Board of Directors respectively for autonomous companies based on explanatory documents. The accelerated depreciation table for the equipment in above considered example is presented in table no. 3.

Table no. 3. Accelerated depreciation table

No. of years	Input value of asset	R(a)	Annual accelerated depreciation	Accumulated accelerated depreciation	Net book value
1	50,000	50%	25,000	25,000	25,000
2	25,000	25%	6,250	31,250	18,750
3	25,000	25%	6,250	37,500	12,500
4	25,000	25%	6,250	43,750	6,250
5	25,000	25%	6,250	50,000	0

Source: authors'processing

From the data presented in the above table results that in the first operating year the machine is 50% depreciated, corresponding to a value of RON 25,000; in the remaining period, the machine it is depreciated according to the straight-line regime, from year 2 to year 5 by the amount of RON 6,250 annually.

A comparison of the three depreciation methods above is presented in Table 4.

Table no. 4. Comparison of annual values specific to the three types of depreciation

No. of years	Input value of machine	Straight-line depreciation (RON)	Degressive depreciation (RON)	Accelerated depreciation (RON)
1	50,000	25,000	15,000	25,000
2	25,000	31,250	10,500	6,250
3	25,000	37,500	8,166.66	6,250
4	25,000	43,750	8,166.66	6,250
5	25,000	50,000	8,166.66	6,250

Source: authors'processing

3. Conclusions

Based on the data presented in tables 1 and 4, it is noticed that, in the case of the straight-line depreciation regime, the recovery of initial investments for asset purchase implies the inclusion in the annual operating expenditure of a constant amount that is, RON 10,000.

In case of using the degressive depreciation regime, as presented in tables 2 and 4, there may be observed that, in the first two years of operation, under the operating costs enter significant amounts, in comparison to the book enter value of the asset, while the depreciation expenditures are relatively smaller in the remaining period.

The use of the accelerated depreciation, presented in tables 3 and 4, involves a much faster form of recovery of the value of the machine, considering the avoidance of obsolescence. This method affects the entity's profit in the sense of reducing it in the first year after the asset is put into operation, with a reduction in the corporate tax; for this reason, the use of this method is subject to prior approval by the tax authority. However, this depreciation regime has the advantage that it provides the premises for the company to use the cash resulting from the tax reduction for financing the renewal of the fixed assets. Not least, from an investments project perspective, using of the accelerated, besides the degresive depreciation method, have positive impact towards the discounted values of the cash flow, implying improved project feasibility (Mieilă, 2009). The choice of the degressive or accelerated depreciation system has the advantage of a positive impact on the treasury of the economic agents, by creating a temporary tax advantage, particularly in the case of investments made from own resources (Teodorescu & Mihai, 2015). Also, in inflation situations, the temporary tax advantage thus created allows obtaining a benefit through the effect of monetary depreciation (Teodorescu & Mieilă, 2018).

Based on the above, in our opinion, there may be considered that the degressive and accelerated depreciation are best fitted to the application of the prudence principle in accounting.

However, the enumeration of these advantages specific to the degressive and straight-line depreciation regimes does not mean that they are always appropriate. Considering that the major objective of financial management is to maximize the business or the company value, it is recommended that the depreciation regime to be chosen based on maximum efficiency, taking into account the specific objectives of each company and the decision of its owners.

References

1. Andrei, J.V., Mieilă, M. and Panait, M., 2017. Transformations of the Romanian agricultural paradigm under domestic economic policy reforms: An analysis during 1960–2011. *Land Use Policy*, (67), pp. 288-297.

2. Badea, L. and Mieilă, M., 2008. The economic efficiency of field crops cultivation in South Romania: trends and actions for improvement. *Annales Universitatis Apulensis Series Oeconomica*, 10(1), pp. 328-336.
3. Cenar, I., Todea, N. and Deaconu, S.C., 2003. *Contabilitate practică*. Cluj-Napoca: Ed. Risoprint.
4. Ciutacu, C., Chivu, L. and Andrei, J.V., 2015. Similarities and dissimilarities between the EU agricultural and rural development model and Romanian agriculture. Challenges and perspectives. *Land Use Policy*, (44), pp. 169-176.
5. Feleagă, N. and Ionaşcu, I., 1998. *Tratat de contabilitate financiară* (vol. II). Bucharest: Ed. Economica.
6. Ion, R.A. and Andrei, J.V., 2014. *Greening the Common Agricultural Policy. Challenges and perspectives for Romanian agriculture towards European new reforms*, p.08-30; in *Contemporary issues of sustainable rural development: international approaches and experiences of Eastern Europe and Russia:* Monograph: V. Erokhin, A. Ivolga, J. V. Andrei et al. - Stavropol: AGRUS of Stavropol State Agrarian University, http://ageconsearch.umn.edu//handle/16304l
7. Law no. 82/1991 on accounting, republished, as amended and supplemented.
8. Law no. 571/2003 on Romanian Fiscal Code, as amended and supplemented.
9. Luţă, D. and Grigorescu, S., 2013. Efectele politicilor contabile de întreprindere referitoare la amortizări asupra rezultatului şi impozitului pe profit. *Revista Strategii Manageriale*, 20(2), pp. 61-66.
10. Mieilă, M., 2009. *Managementul Investiţiilor*. Bucharest: Ed. Cartea Studenţească.
11. Order of the Minister of Public Finance no. 3055/2009 for the approval of accounting regulations compliant with the European directives.
12. Paliu-Popa, L., 2010. *Contabilitate financiară*, vol. II, Târgu Jiu: Academica Brâncuşi.
13. Popescu, D., Cucui, I., Stegăroiu, I., Petrescu, M. and Robescu, V.O., 2009. Food crisis, economic crisis and agriculture. *Annals Food Science and Technology*, 10(2), pp. 440-445.
14. Teodorescu, M., Mihai, D. (2015) L'amortissement fiscal et son incidence sur les décisions d'investissement des entreprises roumaines *Revue valaque des études économiques*, vol. 6(1): 75 – 84.
15. Teodorescu, M. and Mieilă, M., 2018. Taxation and the cost of leasing in Romania: an analytic examination. *Review of Financial Studies*, 3(5), pp. 244 – 260.
16. Todea, N., 2002. *Contabilitate – aspecte teoretice şi aplicaţii practice*. Cluj-Napoca: Ed. Aeternitas.