

## THE ECONOMICAL EFFICIENCY OF THE APPLICATION OF BIO-STIMULATORS AT SOME FODDER

### EFICIENȚA ECONOMICĂ A APLICĂRII BIOSTIMULATORILOR LA UNELE PLANTE FURAJERE

Luminita Cojocariu, Tiberiu Iancu, Marinel Horablaga,  
Adrian Cojocariu, Adina Horablaga

U.S.A.M.V.B. TIMIȘOARA

Calea Aradului, nr. 119; luminitacojocariu@yahoo.com

**Abstract:** The introduction and generalization in production of the latest technologies for fodder cultivation must also rely on the calculation of the economic efficiency. The purpose of these calculations is to give an opportunity to each producer for choosing the optimum technological variants, with great productions on the surface unit, of high quality and low costs. In general, in the classical intensive technologies of fodder cultivation, there isn't always a direct correlation between the level of the achieved productions and the size of the economical indicators, because the economic efficiency is very much influenced by the value of the expenditures made. In a zootechnical farm the fodder is to be found through the animals and respectively through the products obtained from the animals and subsequently the economical efficiency is not directly related to the profit rate. Moreover some fodder is not bought/ sold. Some fodder is only cultivated in specialized zootechnical farms for feeding herbivores, which daily consume significant quantities of biomass (IUVM- daily consumes 50-60 kg of green mass). We have calculated the economic efficiency of the Alfalfa and English Ryegrass because of the fact that the hay of leguminous plants and gramineae are commercialized on a large scale in the Banat area. The average selling price of Alfalfa hay is 0,078 €/kg, and that of the English Ryegrass is 0.065 €/kg. The application of the bio-stimulators for growth in the case of Alfalfa and English Ryegrass cultivation led to an increase of the hay production per hectare, which also led to an increase of the revenue obtained per surface unit.

**Rezumat:** Introducerea și generalizarea în producție a celor mai noi tehnologii de producere a furajelor, trebuie să se bazeze și pe calculul de eficiență economică. Scopul acestor calcule este de a da posibilitatea oricărui producător de a alege variantele tehnologice optime, cu producții mari la unitatea de suprafață, de calitate superioară și costuri scăzute. În general, în tehnologiile intensive clasice de cultivare a plantelor furajere, nu există întotdeauna o corelație directă între nivelul producțiilor realizate și mărimea indicilor economici, deoarece eficiența economică este mult influențată de valoarea cheltuielilor efectuate. Într-o fermă zootehnică furajele se regăsesc prin intermediul animalelor, respectiv prin produsele obținute de la animale, ca atare eficiența economică nu o raportăm strict la rata profitului. Ba mai mult anumite furaje nu se vând/cumpără. Unele plante furajere se cultivă numai în fermele zootehnice strict specializate în scopul hrănirii animalelor erbivore, cele care consumă zilnic cantități însemnate de biomasă (IUVM- consumă zilnic 50-60 kg de masă verde). Am calculat eficiența economică la lucerna și raigras englezesc datorită faptului că fanul de leguminoase și graminee se comercializează la scară largă în zona Banatului. Pretul mediu de vânzare al fanului de lucerna este de 0,078 (€/kg), iar a celui de raigras englezesc este de 0,065 (€/kg). Aplicarea biostimulatorilor de creștere în cazul culturii de lucernă și raigras englezesc a dus la o creștere a producției de fân la hectar, ceea ce a condus implicit și la o creștere a venutului obținut pe unitatea de suprafață.

**Key words:** Alfalfa, *Lolium perenne*, economic efficiency, hay  
**Cuvinte cheie:** lucerna, *Lolium perenne*, eficiența economică, fân

## INTRODUCTION

One of the greatest challenges met by the fodder cultivators, over the last 20 years is the accentuation of the quality of the fodder. Although the production of the crops is still the primary economic factor, the quality of the fodder has immediately become the secondary one. The requirements related to the quality of the fodder, respectively the hay – the product which is sold and bought, does not only affect the marketing, but also the management of the crop, which leads to the increase of the price.

The applications of bio-stimulators constitute primary measures for increasing the hay production, obtained at the analyzed fodder (Alfalfa and English Ryegrass).

## MATERIALS AND METHODS

The experiments were conducted in the experimental field of the discipline *The Cultivation of Lawns and Fodder* from the Didactical Station of the University of Agricultural Sciences and Veterinary Medicine of Banat, Timisoara. The location of the field is in the West Plain and the soil for the experiments is cambic chernozem.

The treatment with bio-stimulators was applied at Alfalfa and English Ryegrass after every mowing, during the vegetation – in the following doses Megafol 3.5 l/ha, Folibor 5 l/ha and Cropmax 1l/ha.

The indicators used for the evaluation of the economic efficiency of production are:

- The profit per unit of production (€/ha)
- The profit per unit of product (€/t)
- The profit rate (%)

As in any other production activity, we try to make profit and to maximize it through the application of bio-stimulators.

The profit is determined as a difference between the total income and the total costs of production, as follows:

$$P_r = I_t - C_t$$

Where:

Pr – the profit

It – the total income

Ct – the total cost

Consequently, the quantification of the profit is necessary, no matter its form, in absolute measures (as mass, as volume) and relative ones (as rate).

The profit rate is a relative measure, which is calculated through the reporting of the profit mass (Pr) to the quantity of expenditures (Ex)

$$r = \frac{Pr}{Ex} \cdot 100$$

The profit rate is very important in the case of bio-stimulators, since we have to determine which variants offer a higher rate.

The expenditures done on a surface unit for the variants with a bio-stimulator application have variable values depending on the costs of every bio-stimulator applied and on the number of applications.

We have calculated the economic efficiency for Alfalfa and English Ryegrass, due to the fact that the hay of leguminous plants and gramineae are commercialized on a large scale in the Banat area. The average selling price of Alfalfa hay is 0.078 €/kg, and that of English ryegrass hay is 0.065 €/kg.

**RESULTS AND DISCUSSIONS**

The application of the growth bio-stimulators in the case of the Alfalfa crop led to an increase of the hay production/ha, which implicitly led to an increase in the achieved income on the surface unit.

The results of the conducted research, regarding the economic effect registered after the application of the bio-stimulators are presented in table 1.

Table 1

Indicators of the economic efficiency for Alfalfa, year I – 2008

Nr. crt.	Specification	Expenditures (€/ha)	The average hay production (t/ha)	The income (€/ha)	The profit on the surface unit (€/ha)	The profit on the product unit (€/t)	The profit rate %
1	Sample	373,60	7,5	585,00	211,40	28,19	56,58
2	Megafof	415,60	8,88	692,64	277,04	31,20	66,66
3	Folibor	406,30	8,53	665,34	259,04	30,37	63,76
4	Cropmax	453,10	9,35	729,30	276,20	29,54	60,96

Source: own calculations

At the Alfalfa crop we notice that the application of bio-stimulators led to an increase of the average production of hay by 1.38 t/ha at Megafof, 1.03 t/ha at Folibor and 1.85 t/ha at Cropmax, compared to the untreated sample. According to this indicator we could state that, we recommend the utilization of the bio-stimulator Cropmax.

As mentioned above, from an economic point of view, the calculation of the profit offers us a realistic image, when we have to choose the bio-stimulator to use.

In diagram 1 and 2 we have presented the achieved profit per product unit, respectively euro/ton of hay and the surface unit, respectively euro/ha.

From the point of view of the profit on the product unit (diagram 1), in the case of the application of the three bio-stimulators, the profit level is above the level registered in the case of the untreated sample. The highest level of profit/hay ton was registered at the application of Megafof (31.20 Euro/t), which represents an increase in the profit by 10.67%. In the case of the application of Folibor, the profit increase/ hay ton is of 7.73% and in the case of Cropmax the increase is 4.79%.

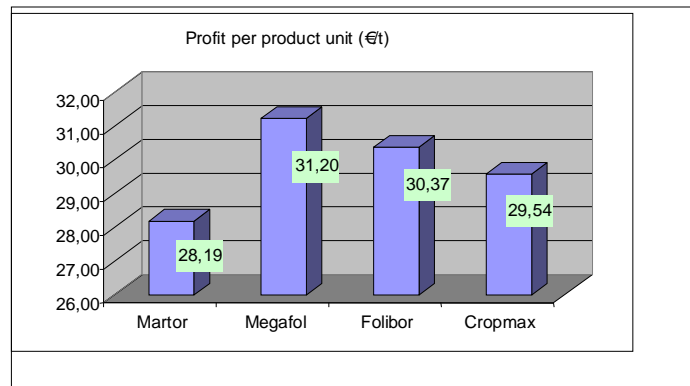


Diagram 1. The profit per product unit (Euro/ton) at Alfalfa in the first year of production (Martor=Sample)

From the point of view of the profit on a surface unit (diagram 2) in the case of Magaflor application, the profit level (277.04 euro/ha) is increased by 65.64 Euro/ha compared

to the sample, which represents an increase by 31.05%. In the case of Folibor the increase is of 47.74 Euro/ha, respectively 22.54% and at the application of Cropmax an increase of 64.8 Euro/ha, respectively 30.65% was registered.

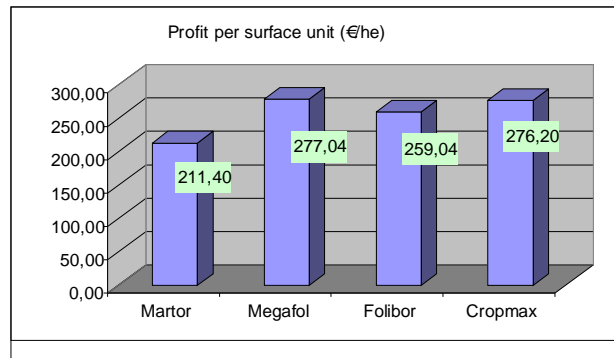


Diagram 2. The profit per surface unit (Euro/Ha) at Alfalfa (Martor=Sample)

The analysis of the profit rate (diagram 3) clearly reflects that the application of Megafol determines the highest profit rate (66.66%). On the second place stands Folibor with 63.76 % and on the last place we have Cropmax with 60.96%. Although the biggest growth in the hay/ha production was registered in the case of Cropmax, from an economic point of view we recommend the utilization of the Megafol bio-stimulator, which registers the highest profit rate.

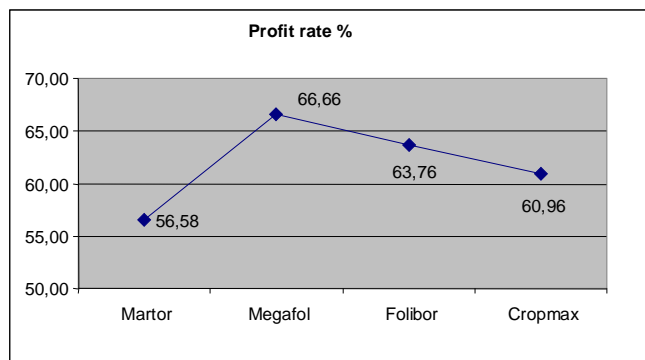


Diagram 3. The profit rate (%) for Alfalfa (Martor=Sample)

In the next years the expenditures for Alfalfa will be much diminished, since this is a plant, which is kept in cultivation for 4-5 years.

In the case of English Ryegrass the application of bio-stimulators also leads to an increase of the average productions by 0.84t/ha in the case of Megafol, 0.17 t/ha for Folibor and 0.98 t/ha in the case of Cropmax.

In diagram 4, 5 and 6 we have presented the profit obtained per product unit, per surface unit and the profit rate.

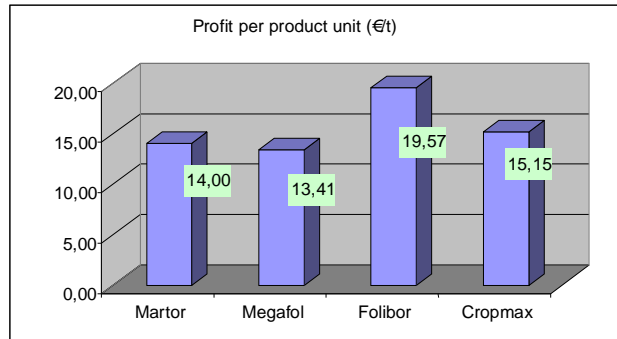


Diagram 4. The profit per product unit (Euro/ton) for English Ryegrass (Martor=Sample)

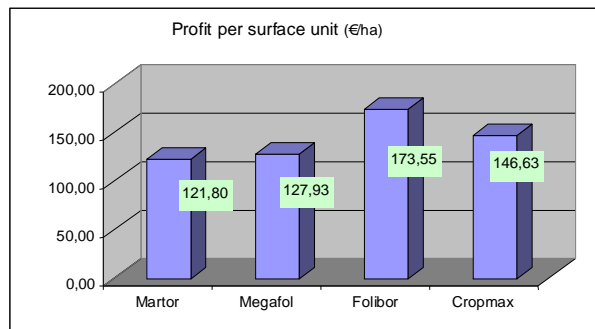


Diagram 5. The profit per surface unit (Euro/ha) for English Ryegrass (Martor=Sample)

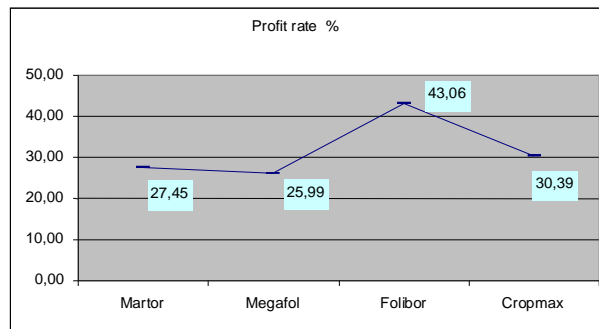


Diagram 6. The profit rate (%) for English Ryegrass (Martor=Sample)

The analysis of these indicators highlights the following aspects:

- In the case of the profit per product unit, respectively Euro/ton, the highest value is registered in the case of the application of the Folibor bio-stimulator (an increase of 39.78% compared to the sample, respectively 5.57 Euro/ton)
- For the hectare we also register the highest profit in the case of Folibor (173.55 Euro/ha), which represents an increase of 51.75 Euro compared to the sample (an increase by 42.48%)

- The highest profit rate (43.06%) was achieved in the case of the application of the Folibor bio-stimulator

### CONCLUSIONS

The results of the conducted research, regarding the economic efficiency of the application of the bio-stimulators for Alfalfa and English Ryegrass emphasize the following aspects:

- The calculation of economic efficiency for the Alfalfa hay proved that as a result of the application of bio-stimulators, the profit per surface unit can reach as far as 295.04 Euro/ha according to the applied bio-stimulator. The application of the Megafol bio-stimulator determines the highest profit rate (66.66%).

- The economic efficiency achieved as a result of the application of bio-stimulators for the English Ryegrass, in the year 2008, takes shape through obtaining a profit per surface unit between 127.93 Euro/ha (at the application of Megafol) and 173.55 Euro/ha (at the application of Folibor). The profit rate showed values between 25.99 % and 43.06% according to the applied bio-stimulator. The highest profit rate for the English Ryegrass was achieved through the application of the Folibor bio-stimulator.

From the facts presented above we can conclude that even though the average production/ha registered the highest increase in the case of the application of the Cropmax bio-stimulator, from an economic point of view the application of the Folibor bio-stimulator is recommended for the English Ryegrass and the Megafol bio-stimulator in the case of Alfalfa.

### BIBLIOGRAPHY

1. ȘTEFAN G., 2006 - Economie agrară – Editura Junimea, Iași
2. IANCU T., 2007 - Economie agrară – Editura Agroprint, Timișoara
3. NICULESCU NICULAE G.; BUDA STELUTA, 2000 - Progres tehnic. Management modern. Eficiență economică– Editura Economică, București
4. GOJE GH., 1999 - Progres tehnic și eficiență economică, Editura Mirton, Timișoara
5. HOTEA C.R., 2001 – Analiza rentabilității în exploatațile agricole familiale, Editura Tera Nostra, Iași
6. RETHWISCH D. M., 2003 – Effects of plant growth regulators on agronomic crop yield. The Plant Regulation Society of America. Volume 31, Nr. 2, April-June.
7. LUMINITA COJOCARIU, A.MOISUC, 2006 - Phenophases in the Medicago sativa species in Timisoara Romania, International conference on: Information Systems in Sustainable Agriculture, Agroenvironmental and Food Technology; Volum III, CD SET 960-8029-42-2; ISBN 960-8029-45-7, pp. 930-934; Volos, Greece.