

## ANALYSIS OF EFFICIENCY INDICATORS OF FLAX FOR OIL CULTURES

MILIN IOANA ANDA\*<sup>1</sup>, MERCE IULIANA IOANA<sup>1</sup>, PETROMAN CORNELIA<sup>1</sup>,  
PET Ț ELENA<sup>1</sup>, GHERMAN REMUS<sup>1</sup>

<sup>1</sup>*Banat's University of Agricultural Sciences and Veterinary Medicine "King Michael I of Romania" from Timisoara, Faculty of Management and Rural Tourism, Romania*

\*Corresponding author's e-mail: anda\_milin@yahoo.com

**Abstract:** *The origin of area of the flax for oil is considered to be the center and west of Asia, from where it spread to the west and north. At present, about 50% of the area cultivated with oil flakes is in Asia (India being the largest cultivator, followed by China), about 25% of the cultivated area is in North America (Canada). Europe grows flax for oil in UK, France, Russian Federation, Belarus and Ukraine (which are seriously investing in the production of linseed for oil, which they export to Europe). The causes that hinder the expansion of culture in European countries are low production and inconsistency, as well as strong competition from Canada's seed imports. The European Union is the largest consumer of seeds and flax for oil. In Romania, in recent years, the interest of farmers for this culture has diminished greatly due to the lack of demand for linseed oil on the Romanian market. In the paper we have conducted an economic efficiency study for this crop, for two years, a study conducted within a plant farm in Timis County.*

**Key words:** *flax for oil, oil plants, efficiency*

### INTRODUCTION

In the group of oil plants there are plant species that have the capacity to accumulate oil in various organs in the proportion of 17-67%. These species are grassy or arboreal, annual or perennial and belong to different botanical families [2]. The formation and accumulation of fatty substances is a complex process of photosynthesis closely related to the intensity and frequency of light and the ability of plants to harness the energy of the sunlight [3].

Flax cultures is included in the group of typical oil plants and is grown for its seeds which provide a multi-purpose sicative oil: paint and varnish manufacture (80% of total production), linoleum, moss, printing (manufacturing special inks) [10, 11].

The material resulting from the extraction of oil are among the most valuable (34-37% protein substances, 30% carbohydrates, 8% lipids) and are used mainly for feeding cows and dairy cows [5]. The thrushes remaining after threshing are bundled and used as matter a pulp for the production of pulp and paper, or for the extraction of webs.

### MATERIALS AND METHODS

From the point of view of soil requirements, the flax is pretentious, preferring medium-textured varieties with good water retention capacity. The favorable area of culture in our country, is in the central and hill area of the Crisury, Banat, Oltenia and Muntenia Plain [7]. The quality of the flax seed is given by the oil content and especially by its quality, expressed by the iodine index. Linoleic (21.6-69.6%), linolenic (18.5-40.5%), palmitic (6.7%), oleic acids (2.3-17.6%) and stearic acid (3.0%), which gives it saliva oils. Seeds also contain 22-25% of protein substances.

The climate strongly influences the iodine value: in warm climates, saturated fatty acids accumulate in a higher proportion, forming highly unsaturated oils; in the temperate climate, more unsaturated fatty acids form, which give rise to sizable oils [2, 4, 6].

**Table 1.**  
**Classification of oil seed species by iodine index value**

Plants	Iodine Index	Sicativity Group
Perila	181 - 206	Saturated oils
Lalemanția	162 - 203	
<b>Flax</b>	<b>168 - 192</b>	
Hemp	140 - 169	
Poppy crop	131 - 143	Semisolid oils
Sunflower	119 - 144	
Safflower	115 - 155	
Soy	107 - 137	
Sesame	103 - 112	
Cotton	101 - 117	
Rape	94 - 112	Non-toxic oils
Ricin	81 - 86	
Olive	78 - 95	
Peanuts	90 - 103	

Source: [1, 7, 8]

### RESEARCH RESULTS

From an agronomic point of view, the flaxis one of the precursor plants for the other cultures, and very good precursors for barley and winter wheat. The agricultural company we conducted the case study used linseed cultures for oil as a precursor for autumn crops. Flax cultures is a good precursor for all crops grown in the local area. Productions that can be obtained are between 1500-1700 kg/ha [9].

The analysis of the economic efficiency indicators linseed culture for oil showed the following observations:

- the average yields of 1430 and 1560 kg/ha indicate that they are below the normal production level expected for this crop.
- direct expenses represent, in both years, 60% of the main production expenditure, material expenditure is 36% and labor expenditure is 23%.
- indirect costs account for 39% of primary production expenditure.

The production cost is between 2502 and 2566 lei / ton, in the conditions of capitalizing the production at a price of 1350-1400 lei/ton. Against this background, the agricultural society did not make profits for this culture. It is one of the reasons why it does not appear in the crop chart in 2018.

**Table 2.**

**The main indicators of economic efficiency in flax culture**

Specification	UM	Way of calculation	2016	2017
Average production	Kg/ha	A	1,430	1,560
Direct expenses	Lei/ha	B = C + D	2,214	2,354
Material expenses	Lei/ha	C	1,354	1,444
Labor costs	Lei/ha	D	860	910
Indirect expenses	Lei/ha	E	1,455	1,549
Main production expenses	Lei/ha	F = B + E	3,669	3,903
Cost of production	Lei/t	G = F / A * 1000	2,566	2,502
Recovery price	Lei/t	H	1,350	1,400
Grant	Lei/ha	I	1,200	1,200
Profit per hectare	Lei/ha	J = H * A / 1000 - F+I	-539	-519
Profit rate	%		-20.99%	-20.74%

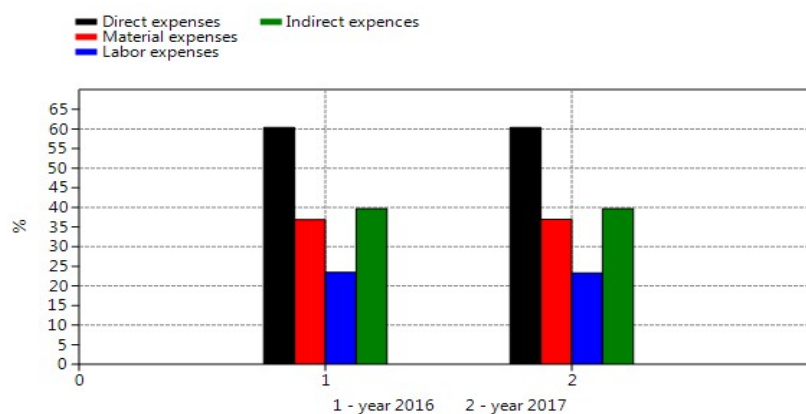
Source: domestic data of the agricultural society [10, 11, 12, 13]

Regarding the structural analysis of the material expenditures for the flax culture, it can be seen from table 2, that the highest share in the analysis period is the one related to the chemical fertilizers, followed by the expenses with the seed.

**Table 3.**

**Structure of the cost of production for flax culture**

Flax culture	UM	2016	2017
Average production	Kg/ha	1,430	1,560
Direct expenses	%	60.34	60.34
Material expenses	%	36.90	36.99
Labor expenses	%	23.43	23.31
Indirect expences	%	39.65	39.68



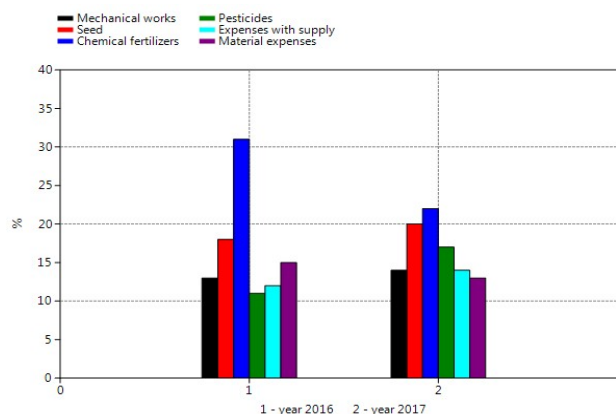
**Figure 1. Structure of the cost of production for flax culture**

**Table 4.**

**Structure of flax material expenses**

Flax for oil	UM	2016	2017
Average production	Kg/ha	1,430	1,560
Mechanical works*	%	13%	14%
Seed	%	18%	20%
Chemical fertilizers	%	31%	22%
Pesticides	%	11%	17%
Expenses with supply***	%	12%	14%
Material expenses**	%	15%	13%
TOTAL	%	100%	100%

Note: \* Mechanical work includes the cost of the fuel used; \*\* Material expenditure includes repair and lease costs; \*\*\* Supply costs include crop insurance costs, external services, electricity.



**Figure 2. The structure of materials for flax for oil cultures**

Preparing the land for the sowing of sunflower requires great attention because the flax is like a spring, very superficial - 25 cm. [14]. The seed used for sowing must be of high purity (97%) and germination of 90%. The amount of appropriate seed is 100 kg-ha. Flax culture is a fully mechanized culture. Harvesting is done with well-adjusted strawberries [15].

### CONCLUSIONS

In our country the interest of farmers for this crop has decreased due to the fact that it is a pretentious culture in terms of soil work, sowing, the use of certified and treated seed, requires the execution of weed control works that can cover the crop, especially in the first phases, when the flax has a slow growth. Disease loss (anthracnose and fusariosis) and pests (trip) are performed with the recommended chemicals.

Among the factors that could contribute to expanding the areas cultivated with flax for oil may be the world shortage of oil and flax cakes and the increasing demand for flax seed and flax seed oil in Western Europe.

We believe that there is a need for greater concern from the Ministry of Agriculture and representatives of the processing industry, to expand such a valuable plant in culture.

### REFERENCES

- [1]. **BĂLTEANU GH.**, 1974, Fitotehnie, Ed. Didactica si Pedagogica, Bucuresti
- [2]. **BOERU GH.**, 1980, Tehnologia uleiurilor veghetale, Ed.Tehnică, București
- [3]. **GAVRILENKO V.**, 1984, Fabricarea uleiurilor vegetale prin extractie, Ed.Tehnică, Bucuresti
- [4]. **MOATĂR MIHAELA, STANCIU S., CIOLAC R., ȘTEFAN CAROLINA, RUJESCU C.**, 2013, Water consumption by forest vegetation used for restoration of degraded land, Journal of Food, Agriculture & Environment
- [5]. **NEDELCU N.**, 1993, Tehnologie si utilaj pentru industria uleiurilor si grasimilor, Ed. Universitatea Galati
- [6]. **PETROMAN C.**, 1999, Procesarea produselor agricole, Ed. Mirton, Timisoara
- [7]. **POP G.**, 2007, Tehnologii Agricole, Ed. Agroprint, Timisoara
- [8]. **SALA F.**, 2011, Agrochimie, Ed. Eurobit, Timisoara
- [9]. <http://www.madr.ro/agricultura.html>
- [10]. <http://www.madr.ro/culturi-de-camp/plante-tehnice/inul.html>
- [11]. <http://www.madr.ro/industrie-alimentara.html>
- [12]. <http://statistici.insse.ro/shop/>, National Institute of Statistic
- [13]. [https://ec.europa.eu/eurostat/statisticsexplained/index.php/Agrienvironmental\\_indicator\\_-\\_irrigation](https://ec.europa.eu/eurostat/statisticsexplained/index.php/Agrienvironmental_indicator_-_irrigation), Agri-environmental indicator – irrigation
- [14]. [https://portal.afir.info/informatii\\_generale\\_pndr\\_investitii\\_prin\\_pndr\\_sm\\_4\\_1\\_exploatatii\\_agricole](https://portal.afir.info/informatii_generale_pndr_investitii_prin_pndr_sm_4_1_exploatatii_agricole), Submăsura 4.1-Investiții în exploatații agricole
- [15]. [https://portal.afir.info/informatii\\_generale\\_pndr\\_investitii\\_prin\\_pndr\\_sm\\_7\\_2\\_infratructura\\_rurala](https://portal.afir.info/informatii_generale_pndr_investitii_prin_pndr_sm_7_2_infratructura_rurala), Submăsura 7.2 - Investiții în crearea și modernizarea infrastructurii de bază la scară mică.