ECONOMIC IMPORTANCE OF ORGANIC FLAX CULTIVATION IN WESTERN ROMANIA

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Abstract: *Recent statistical data and market studies have shown that the organic products market is on an ongoing upward trend in Europe and globally. For Romania, organic farming is still an underexploited niche with real and true development potential of the agricultural sector. Flax and, especially, organic flax, is less and less cultivated in Romania. The present paper aims to analyse organically grown areas worldwide, highlighting Romania's position compared to other countries cultivating organically. As for our country, the objective of the study is to assess the organic crop in the western Romania and its economic importance. From the study, it was discovered an important company in western Romania, which understood the economic importance of cultivating flax and linseed oil, respectively, trying to develop and research over time the best varieties and the most qualitative oil.*

Key words*: organic flax, organic flax oil, Romania*

INTRODUCTION

Recent statistical data and studies have shown that the organic products market is on an ongoing upward trend. According to the most recent FIBL survey on globally certified organic farming, since the end of 2015, organic farming data were available in 179 countries compared to 2014, when there were only 172 countries. Thus, in 2015, there were 50.9 million hectares of organically farmed land, including in conversion areas. The regions with the largest areas of organically farmed land are Oceania, with 22.8 million hectares, which hold almost 45% of the world's organically farmed land, and Europe, with 12.7 million hectares, i.e. 25%. Latin America owned 6.7 million hectares, i.e. 13%, followed by Asia with 4 million hectares, i.e. 8%, North America with 3 million hectares, i.e. 6%, and Africa with 1.7 million hectares, i.e. 3% [1, 14].

Global organic areas are increasing in 2015 by almost 6.5 million hectares compared to 2014. However, many other countries have reported significant growth thus contributing to global growth, such as the United States, an increase of 30% and India by 64%, both by 0.5 million hectares, and Spain and France, both with an additional 0.3 million hectares. In Africa, the area increased by almost 33.5% and 0.4 million additional hectares, respectively.

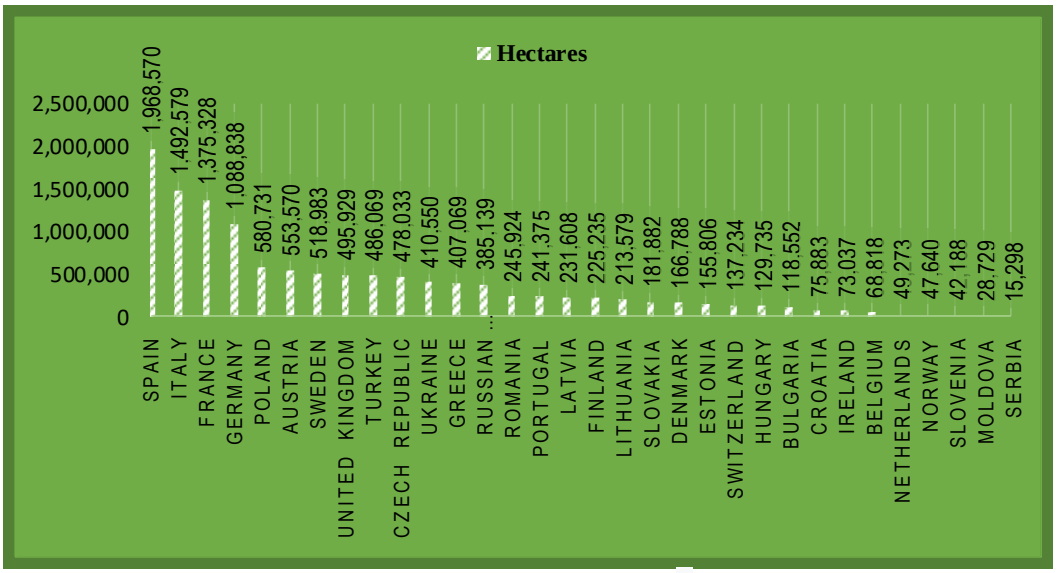

Figure 1. Land area cultivated organically, by country, in 2015

Source: After FIBL 2017 data

In Asia, the area increased by 11% (i.e. almost 0.4 million hectares), and in North America by more than 21% (i.e. over 0.5 million additional hectares). The growth of organically farmed land has been noted in many African countries, such as Kenya, Madagascar, Zimbabwe, and Côte d'Ivoire [1,15].

According to the 2017 statistical data, Romania had an area of 245,924 ha organically farmed land, being among the top 10 countries holding organically farmed land areas [2].

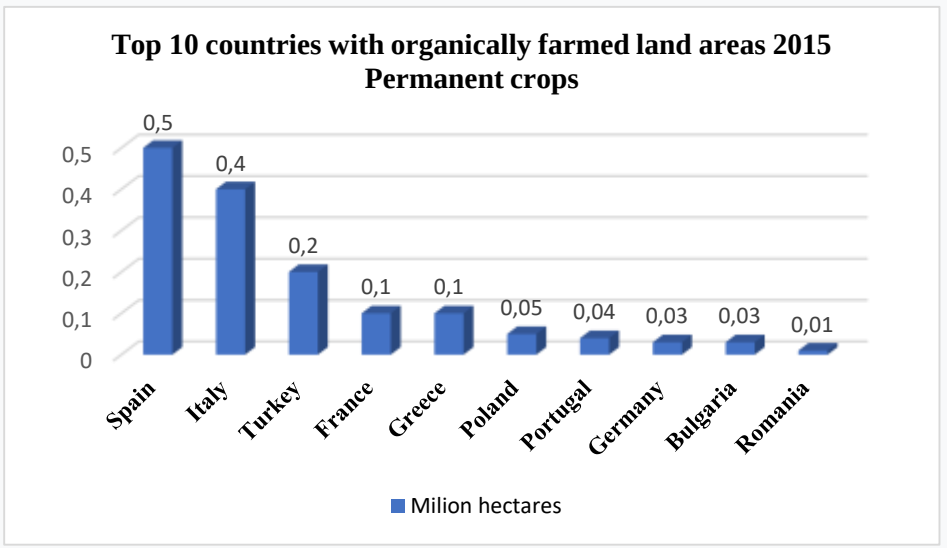

Figure 2. Top 10 countries with organically farmed land areas. Permanent crops

Source: After FIBL 2017 data

MATERIALS AND METHODS

The scientific article examines the evolution of agricultural areas farmed in accordance with the rules and principles of organic agriculture worldwide, focusing on the cultivation of oil flax, cultivated in Western Romania.

As a working methodology, thorough research of published statistical data available at international and national level was used. Also, a field survey was carried out,

a case study carried out at the "Florea Invest S.R.L.", Timiş County, Romania, which grows organic oil flax.

The methodological system used to process the information gathered relied on methods and processes based on bibliographic, international statistics and national study. For the most appropriate and high-quality use of existing information, the technique of indirect research, documentation and the collection of information have been used in particular in the field of organic farming. For analysis and study, quantitative and qualitative analysis methods were combined in order to better understand the problem studied and to substantiate the conclusions made.

The information was processed using Eurostat databases and statistics available in The World of Organic Agriculture. Statistic and Emerging Trends, FIBL and IFOAM reports. Following the *FIBL survey 2017* market survey, 40,888 ha of flax crops for organic oil were grown in the world.

RESEARCH RESULTS

Following the analysis and study carried out with reference to organically farmed areas, we have found that, in Western Romania, there are currently four companies farming organic oil flax.

In Romania, and especially in its western part, flax has been known mainly for the culture of fibber flax. In Timiş County, the plants were processed at the flax and hemp factory operating in Lovrin.

The flax is part of the Linaceae family, which has about 250 species, the most important species being *Linum usitatissimum* (cultivated flax) [6, 12, 13].

Several varieties of oil flax are grown in Romania. The flax improvement program within the I.N.C.D.A. Fundulea has made an important and lengthy contribution to the creation of oil flax varieties by diversifying the genetic pool of this species [9].

During the breeding programme, 26 varieties were created, including 16 varieties after 1990, namely: Geria (1991), Raluca, Genţiana (1993), Iulia (1994), Floriana (1998), Lirina (1998), Oliana (1998), Alexin (1999), Florinda (1999), Janina (1999), Fluin (2000) and Cristina (2003). These varieties have ensured genetic progress for production potential, with a positive influence on the stability and quality of crops [3, 10, 11].

Flax oil is important due to the high content of alpha linolenic acid, and high flax oil content indicates a good quality of flax oil. In conclusion, the higher the alpha linolenic acid content, the better the oil quality. The fatty acid content depends on the genetics of the variety, so one can know the content of alpha linolenic acid in flax seed[4, 5, 7].

Table 1.

Important oil quality paraments (%)

Fatty acids	Min	Max
Palmitiacid	4	7
Stearic acid	2	6
Oleic acid	9	27
Linoleic acid	10	22
Linolenic acid	**45**	**65**

Source: After laboratory analyses performed at "S.C. Florea Invest S.R.L."

Oil flax is a plant that requires a well-worked soil, sowing with straw cereal sowers, set at 12.5 cm distance between rows and 3-4 cm deep. Sowing is carried out in spring (in the last decade of March and early April), at a depth of 3-4 cm and at a temperature of about 5°C. For crop rotation, it is advisable to cultivate a legume as a preemergent plant, a condition in which it is no longer necessary to apply fertilisers. Ideally, after harvesting the plant preceding the flax, soil tillage should follow. Because the flax seed is very small in

size, it is important that, in the spring, before the sowing of the linseed crop, the land be very well shredded and levelled. It is important to know that it is never cultivated after sunflower or rape, because the soil remains poor in nutrients (nitrogen and minerals). The Scorpion variety is the most cultivated in Western Romania because it is tall, it is 98% pure and a germination of minimum 90. Harvesting flax for seeds is done with a combine with header for straw cereals.

The most important company in Western Romania that farms organically is "S.C. Florea Invest S.R.L." It is part of the *Bordoni group in Lugano, Switzerland*, one of the most famous holdings in terms of organic oil. As a company with extensive experience in oil production in Switzerland, they came to Romania with an experience of over 170 years.

Working on the Romanian market since 2011, they have experienced the varieties adapted to Western Romania, initially cultivating yellow flax because the market price was higher, and later focusing on brown flax. The company has started to focus on growing brown flax because cleaning seeds through the optical selector is more effective in brown flax compared to yellow flax.

Most of the flax production is used to extract oil, while grits can be used as feed for animals but also in bakery for the manufacture of bread or other bakery products.

As a result of climate change, due to rainy periods, they faced the invasion of weeds such as common wind grass and green foxtail (monocots) that prevented the development of culture, becoming more competitive, so they sought varieties to overshadow and suffocate weeds.

They tried all varieties of flax adapted in Western Romania but, of all the varieties cultivated, they now focus on the varieties Scorpio, Marmelade (Austria) and several French varieties.

The analysis of economic indicators at "SC Florea Invest S.R.L." highlights that the profit achieved ensures a very good economic efficiency in the cultivation of organic oil flax. Thus, for 147 hectares of organically grown flax (2019), the company made a total expenditure of EUR 176,000 and produced a total production of 147 tonnes (on average 1,000 kg of seeds per hectare were obtained).

It is very important to know that the company benefited from a subsidy from APIA of 54,000 euros and the total revenue sought in the oil flax crop was EUR 160,000. In these circumstances, **the approximate profit was 38,000 Euros, with an average of around EUR 258 per hectare**.

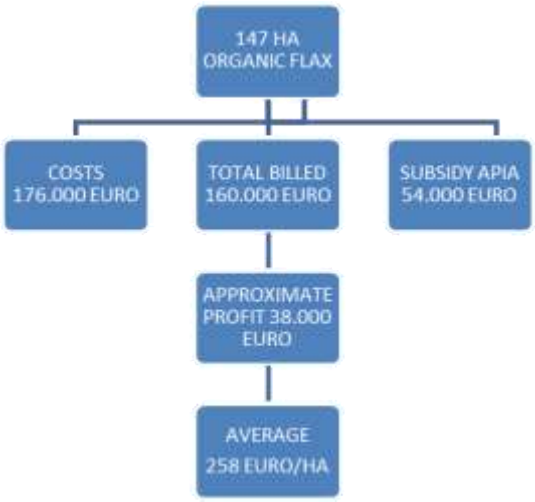

Figure 3. Average organic flax profit per hectare

Source: Processing by data SC Florea Invest SR

CONCLUSIONS

Flax seeds are some of the oldest man-grown foods, consumed for thousands of years. According to the Journal of Food Science and Technology, the Latin name of flax seed is *Linum usitatissimum*, meaning "very useful". They were frequently consumed 5,000 years ago in the old Babylon, then by the Aztec warriors, and also the favourite food of King Charles the Great in the 8th century.

Following the study, the growth and importance of producing organic flax oil in the world and especially in our country is obvious.

The case study carried out in Timiș County points out that the organic production of oil flax ensures a substantial profit for farmers, which recommends it for cultivation on the largest areas.

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